Henry C. Pearson, F. R. G. S., Founder
Edward Lyman Bill, Publisher
B. Brittain Wilson, Business Manager

INDIA RUBBER WORLD

William M. Morse, Editor Emeritus
D. C. McRoberts, Editor
Webster Norris, Associate Editor

Volume 92 | August 1, 1935 | Number 5

Contents

Articles

Departments

Departments

Published monthly by Bill Brothers Publishing Corp., 420 Lexington Ave., New York, N. Y. Cable Address, ELBILL. New York. Subscription $3.00 per year postpaid in the United States and Mexico; $4.10 per year postpaid to Canada; $4.00 per year postpaid to all other countries.

Other Bill Publications are: *Drapery Profits, Premium Practice, Rug Profits, Sales Management, Soda Fountain,* and *Tires.*

INDIA RUBBER WORLD

Published at 420 Lexington Avenue, New York, N. Y.

Volume 92 | **New York, August 1, 1935** | **Number 5**

Properties of Cellular Rubber for Passenger Car Cushions[1]

H. E. Elden[2]

PROGRESSIVE improvements in chassis and body design have been made to improve riding comfort, as is evidenced by the modern automobiles. A contributing factor in this progressive improvement has been and is the increase in the use of rubber. The ability of rubber to absorb large quantities of energy without fatigue, when properly compounded and constructed, is recognized by the automotive engineer.

The latest modern development of the rubber industry for improving the riding comfort of automobiles, busses, trucks, railroad cars, ambulances, and other types of vehicles in the transportation field is cellular rubber. This material has been referred to as Dunlopillo and latex sponge rubber. In the succeeding pages it will be referred to as cellular rubber.

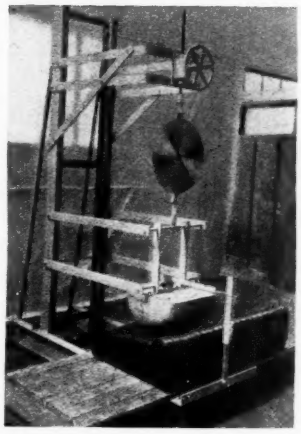


Fig. 1. Static Load Deflection Tester

A certain amount of misconception exists in the mind of those not familiar with cellular rubber regarding the nature of the material, its properties, and applications. It is therefore advisable to give a brief description of the novel method of manufacture and examine its properties before considering the application of cellular rubber for the replacement of springs and padding in passenger car seats.

[1] Paper presented at the summer meeting of the Society of Automotive Engineers at White Sulphur Springs, W. Va., June 16 to 21, 1935. Printed by permission of the S. A. E.

[2] Technical manager, Dunlop Tire & Rubber Corp., Buffalo, N. Y.

Method of Manufacture

During the past decade a tremendous amount of research work has been done in the application of latex to the manufacture of rubber articles. Cellular rubber is one of the most important. Latex, as it is obtained from the tree, has a rubber content of approximately 38% dispersed in water. It is centrifuged in special machines until the rubber content is 60%. At this concentration the latex is a milky-white fluid. A small quantity of ammonia (0.5%) is added as a preservative. Vulcanizing agents and other compounding ingredients in water suspensions are added to the concentrated latex in definite proportions. To a given quantity of this mixture is added a small amount of a froth producing agent. This mixture is beaten into a froth by means of a dough mixer equipped with a special whip. The ratio of the volume of air to latex compound is controlled by the time of frothing and is varied according to the density required in the final product. At the end of the frothing time a small quantity of a gelling agent is added, which after a time interval of about 10 minutes will cause the froth to set to a gel-like formation consisting of countless interconnected air cells which provide complete porosity.

This froth is poured into the molds directly after the frothing operation so that the gellation of the froth will occur in the molds, thereby forming the final shape of the product with the vertical cavities. As the froth is fluid

when poured, complicated and deep molds of any structure or design may be easily filled. After the froth has thoroughly gelled, the molds are conveyed through a tank of water maintained at 205° F. The time of immersion is 60 minutes, during which time the product is vulcanized. Hot water replaces the air in the tiny bubbles during the vulcanization. The mold is now opened and the product removed. Most of the water in the product is then extracted by a centrifuge; then the product is dried in warm air, trimmed, inspected, and ready to ship.

This unique method of manufacture gives a product possessing unusual properties. The product should in no way be confused with ordinary sponge rubber, which has a cell structure, but is produced by an entirely different method, and has very different properties. A brief description of the method of producing ordinary sponge rubber may be of interest.

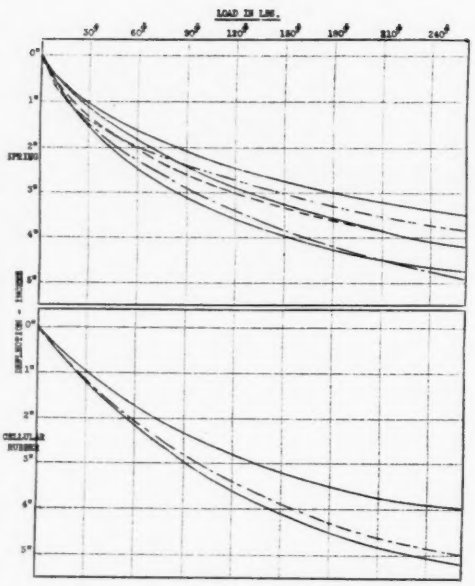


Fig. 2. Load Deflection Curves of Spring and Cellular Seats

Although there are several variations, the general practice is to soften mechanically the crude rubber by mastication between steel rolls until the original tough rubber has been changed to a plastic dough-like mass. A large quantity of softeners is added further to soften the rubber. Vulcanizing and chemical agents plus other compounding ingredients are mixed into the softened rubber. The rubber in sheet form is placed into molds to be vulcanized. The application of heat during the vulcanizing period causes the liberation of a gas from the chemical agents, which swells the rubber and produces the sponge-like structure.

It is necessary that the rubber be very plastic so that the gas formed during the vulcanizing operation will be able to swell the rubber with little effort. Mechanical working of unvulcanized rubber plus large quantities of softeners impairs the physical properties of rubber.

A sponge rubber product usually has a graded texture, gradually increasing in density toward the surface and finally terminating in an impermeable skin. The cells are not connected, unless mechanically broken by passing the sponge rubber through a series of rolls. It is practically impossible to fill deep or complicated molds by this process.

Many types of automobile seat cushions incorporating the use of rubber, such as sponge rubber, rubberized hair in various forms, and pneumatic cushions, may still be considered. These materials may also be used in combination with springs. Diaphragms of stretched rubber webbing have been used as a base for a seat cushion. The use of rubber for the insulation of passenger car seats gives exceptional comfort as it absorbs both road shocks and engine vibrations, according to Cowell.[3]

The properties of cellular rubber as an upholstering material to increase the riding comfort of automobiles will be discussed in conjunction with some of the requirements of a seat for comfort. The conventional spring type of seats will be used for comparative tests in this paper. It is beyond the scope of this paper to discuss the design of a seat in reference to the height, slope and width to determine what is most comfortable.

An automobile seat may be considered an auxiliary suspension system, which can be comfortable in two different ways: initial comfort; sustained comfort.

W. H. Chapman, of the Dunlop Laboratories, England, has discussed initial and sustained comfort so ably in his paper "The Place of Rubber in Motor Car Upholstery," presented before the Institution of Automobile Engineers, November 12, 1934, that it is thought advisable to quote him (with his permission) practically verbatim under the heading of "Initial Comfort."

"The function of an automobile cushion or seat is to enable the occupants to travel with the least possible discomfort and fatigue and to impart a feeling of luxury. The conception of comfort is very complex as numerous physiological and psychological factors are involved. There are, however, certain well defined requirements which can be examined by comparatively simple methods. To perform its function efficiently an automobile seat must do two things. Firstly, it must receive the body without shock and then support it in a natural unstrained position. Excessive local pressures must be avoided. Secondly, it must act as an auxiliary suspension system, very similar in function to the tires and the chassis springs of the car, to reduce to a minimum shocks arising from road irregularities.

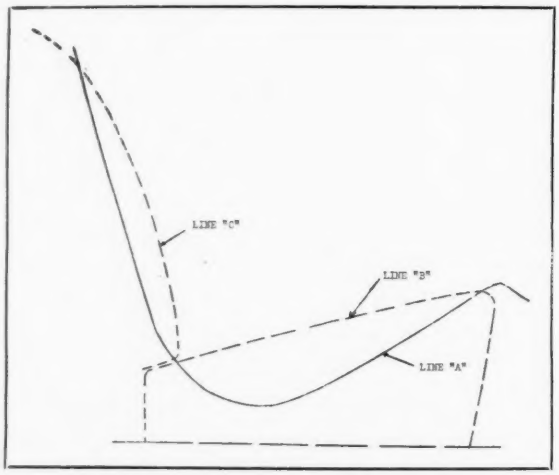


Fig. 3. Seat Comfort Depends on Deflection That Distributes Forces

Initial Comfort

"The ability of a seat to receive the body without shock is determined by the way it deflects when the load of the body is applied. It is important that the load is taken up in a uniform manner as the body advances into the seat. An examination of the static load deflection curve will give valuable information on this point.

"An apparatus for measuring this property is shown in Figure 1. A plunger approximating the human shape

[3] S. A. E., June, 1930.

is lowered into contact with the seat. The applied load is read from the dial of the spring balance, and the thickness or deflection from the vertical scale. Care must be taken that the conditions of support of the seat are identical with those in the car, as frequently baseboards and other supports flex during use, thereby providing additional springing.

"Load deflection curves of typical spring and cellular rubber seats are shown in Figure 2. The characteristics of spring and cellular rubber seats can be varied between wide limits, and, in this respect, there is very little to choose between properly designed seats of these types.

"When assessing the properties of a seat from the static load deflection curve, allowance must be made if the seat is highly damped, as the introduction of this feature will cause the dynamic load deflection curve to be somewhat different from the curve obtained under static conditions. The spring strength of the seat will, in effect, be higher on compression and lower on release, the deviation from the average spring strength being determined by the degree and method of damping employed and the compression rate."

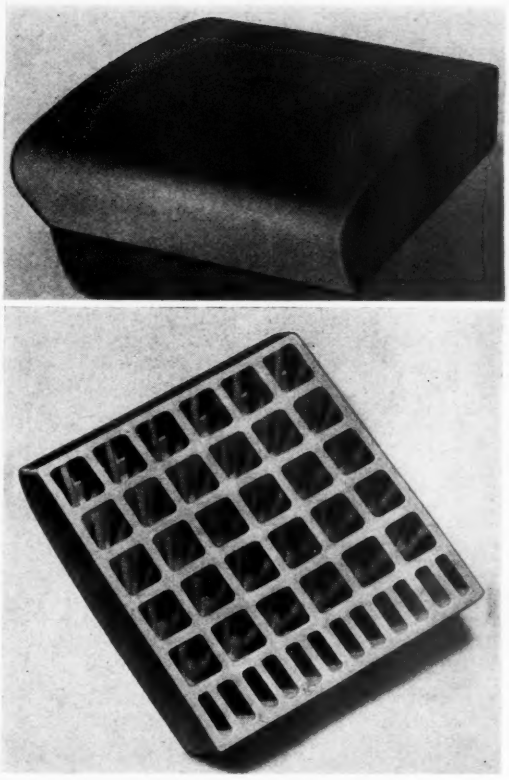


Fig. 4. Top and Bottom Views of Greyhound Bus Cushion

PRESSURE POUNDS PER SQUARE INCH

	Position 1	2	3
Small Car Seats			
Spring	3.3	0.24	0.46
Cellular Rubber..	1.4	0.41	0.50
Medium Car Seats			
Spring	1.7	0.37	0.37
Cellular Rubber..	1.0	0.23	0.30
Large Car Seats			
Spring (1).....	1.9	0.35	0.36
Spring (2).....	1.7	0.45	0.43
Cellular Rubber..	0.86	0.25	0.17

"Readings under the heading Position 1 were taken under the ischium, 2 at the middle of the thigh, and 3 at the front edge of the seat. It will be observed that under the ischium, where on a large number of seats discomfort is felt, the pressures for cellular rubber seats are quite low as compared with the values for corresponding types of spring seats. One of the outstanding features of cellular rubber, as compared with seats constructed of other materials, is the ability to absorb, as it were, irregularities of the body. Moreover other sources of discomfort such as folds in the clothing, buttons, suspenders, and the pleats in leather are almost completely eliminated.

"This can be demonstrated by a very simple test. If a solid article such as a ¾-inch nut be placed between the trimmed cellular rubber seat and the body, it will surprise most people how little the projection interferes with comfort.

"This question of distribution of pressure is very important as too high or too low a pressure soon gives rise to discomfort. We are all acquainted with the feeling of extreme discomfort and fatigue experienced in cars where the seat gives high local pressure and insufficient support to the thighs and the small of the back. With properly designed cellular rubber seats this is entirely eliminated, and greater distances of travel can be covered at a stretch without undue fatigue. In this regard the unloaded shape of the seat deserves considerable attention.

"If we suppose that line A in Figure 3 is the curvature of the body when in the most comfortable position in a particular car, and lines B and C the contour of the upholstery, it is evident that the upholstery must be deep and soft if it is to be capable of deflecting to the shape of the body under normal occupant's weight. The construction must be such that the forces required to cause this deflection are not concentrated on any particular part of the body, but are widely distributed. High local pressures can be avoided to a considerable extent by shaping the upholstery to the contour of the body. A limit to the amount of shaping which can be done is, of course, imposed by variation of human shapes, the positions assumed by different individuals, and trimming consideration.

"Within the limitations of the covering material cellular rubber seats adjust themselves automatically to the contour of the body under very small loads and can therefore be considered as shaped seats.

"Summarizing the question of pressure distribution,

Distribution of Pressure

"The human body is deformable and, owing to the large number of nerve cells distributed over its surface, is sensitive to local pressure of varying intensity; whereas the plunger in the apparatus described merely consists of a rigid block and can therefore only give us a very incomplete picture of the whole story. Hence it becomes necessary to investigate the distribution of pressure over body in contact with the seat. The area of contact on a good car seat is approximately 220 square inches, and the average load, allowing for the weight of the feet and legs carried by the floor boards, is approximately 120 pounds, giving an average pressure of 0.55-pound per square inch.

"The following test to measure the actual pressure of the body on the seat has been developed by Pearce and Bulgin in the Dunlop Laboratories. A small thin flat rubber bag having a surface area of approximately ¼ square inch and containing electrical contacts on the two inner walls is inserted between the passenger and the seat at the point where the pressure is to be measured.

"The air pressure required to inflate the bag sufficiently to cause the electrical contacts to separate is observed. As the rubber bag is very thin and inflated only sufficiently to separate the contacts by a thousandth of an inch or so, the contact pressure is accurately obtained without disturbing local loading conditions to any appreciable extent. Typical results obtained on this test follow:

it is necessary for the seat to mold itself to the body and discomfort will arise if the body is molded to the seat."

Sustained Comfort

It is advisable to discuss the construction of a cellular rubber cushion before proceeding with its properties in reference to sustained comfort. Figure 4 shows the construction of a 1935 Greyhound bus seat cushion.

The profile of a cushion will vary according to the height, width, slope, and appearance, and must be studied for each make and model of car. The internal structure consists of ribs of varying widths, properly reenforced and spaced according to height of the cushion, density of cellular rubber, and load to be supported. Additional reenforcement may be had at the sides to insure stability, and at the front to give a firm edge for upholstering. The reenforcements at the front edge are so arranged that the feeling of softness is perceptible to the passenger. The ribs which run perpendicular to each other form vertical cavities.

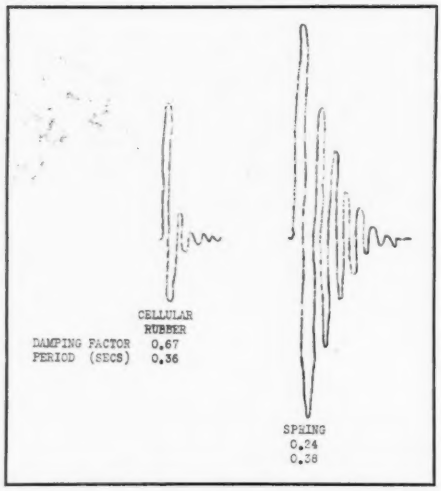


Fig. 5. Vibration Damping Comparison

Owing to high energy capacity and hysteresis loss, rubber has very good vibration absorption and damping properties. In addition to the rubber itself the cellular nature and the air contained in the molded vertical cavities of cellular rubber cushions have damping and vibration absorption properties of value.

A cellular rubber cushion is mounted on a base, which may be plywood, metal, or close woven fabric. A hole is made under each molded cavity. Variation in the size of hole varies the damping properties of the cushion. The depth and density of the cushion and volume of air contained in the cavities also vary the damping properties. All these factors must be considered for the correct application of cellular rubber in each type of seat and model of car. A seat cushion should have a desirable damping factor so that the vibrations of various intensities in the seat due to road irregularities will not persist.

Chapman[4] shows the damping characteristics of a spring and cellular rubber seat in Figure 5. These curves were obtained by delivering a uniform blow to a wooden form supported on the seat under test and recording the resulting oscillations. This form is approximately the same shape as that of a human passenger.

In this paper accelerations in a vertical direction were only considered. Transverse and longitudinal accelerations are very important. The accelerometer tests of accelerations in the three directions, using the Purdue accelerometer, have not been completed for this paper.

The question of distribution of pressure which has just been discussed under the heading "Initial Comfort" is of equal importance for sustained comfort. It is obvious that vibrations of a given intensity will be less disturbing to a passenger on a seat which supports him evenly.

Jacklin and Liddell,[5] of Purdue University, observed that a passenger could withstand vibrations of much greater intensity without feeling uncomfortable on a cushioned seat than when riding on an unpadded seat, and came to the conclusion that when a passenger sinks into a seat cushion, thereby distributing his weight over a larger area and receiving support from various angles, different nerves or muscles are affected by impressed vibrations.

The results of tests conducted by Jacklin and Liddell, and M. Olley[6] on vibrating platforms indicate that the human body is more sensitive to vibrations of a given amplitude as the frequency increases. Therefore the natural frequency of a seat must be kept as low as possible.

Other features of this material are important. The most important of the following will be discussed briefly: temperature, durability or life, method of trimming, weight, odor, absence of noise, hygienic, appearance.

The question of ventilation and temperature naturally arises. Cellular rubber is perfectly satisfactory in this respect. This is explained by the fact that the material is entirely porous, and owing to the movement of the passenger there is a continual circulation of air through the cushion. This can be easily demonstrated by blowing smoke into one of the cavities or through the material where it will be seen to penetrate the material and escape through the upper surface.

The question of actual generation of heat in a cellular rubber seat was tested by recording temperatures over a twenty-four-hour period while subjecting it to rapid compression and release. The seat was covered with imitation leather, and a thermocouple was placed in an exactly similar position on the undisturbed end of the seat. Examination of the temperature curves from 9:00 a.m. to 9:00 a.m. on the following day shows that during periods when the temperature of the atmosphere was rising, the punched end of the seat was slightly warmer than the other end. When the atmospheric temperature was falling, the reverse was true; the working end was actually 1½° cooler. The result is what might be expected as the exchange of air in the cells is greater near the working end.

The durability or life of cellular rubber cushions may be expected to surpass the life of the car in which they are installed. This statement is based on laboratory tests and from results of cushions that have been in service to date.

The operation of assembling the base, cushion, and cover is rather simple. Care must be taken not to apply too much tension to the covering material, which would place the cushion under compression, thereby impairing the initial and sustained comfort to some extent. The use of cotton, wool, hair, or any other material between the cellular rubber cushion and covering material is not only unnecessary but also detrimental.

It is quite possible that a saving in weight can be obtained with a properly designed and installed cellular rubber seat as compared with the present type of spring seat. At least, it should weigh no more. This is a problem to be studied with the automotive engineer.

Cellular rubber and other products made from latex may be considered odorless, providing compounding in-

(*Continued on page* 36)

[4] "The Place of Rubber in Motor Car Upholstery," paper presented before Institution of Automobile Engineers, and India Rubber Inst., Nov., 1934.
[5] "Riding Comfort Analysis," Research Engineering Bulletin, Purdue University, Series No. 44.
[6] S. A. E., Mar., 1934.

Compounding Ingredients

Compositions—Properties—Functions

INGREDIENTS for compounding latex grouped by functions comprise latex stabilizers for prevention of coagulation; thickening or creaming agents to impart viscosity; protective colloids to aid suspension of solid particle ingredients; wetting agents to aid in their dispersion; and accelerators; antioxidants; vulcanizing agents, etc.

Latex Chemicals

It is possible by these agencies to compound in latex the same ingredients as are employed in dry rubber compounding. A well proportioned latex mixing is characterized by uniform dispersion of its components which remain in suspension indefinitely on standing.

The materials described are those commonly used in latex work. Certain others are not included here because they appear in a previous installment of this series.[2] The missing items are: Antox, Dispersed; Aresklene; Aquarex D; Aquarex F; Darvan; Heliozone, Dispersed; Rubberine-Gel; Saponine; Sulphur, Colloidal; Zinc Oxide, Colloidal.

Accelerators

Accelerator 85

CHEMICAL COMPOSITION. A 50% water solution of the potassium salt of mercaptobenzothiazole.
SELLER. E. I. du Pont de Nemours & Co., Inc.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Amber colored liquid.
PROPERTIES. Sp. gr., 1.28. Stability excellent, but should be stored in glass or iron. Non-toxic. Odorless. Does not discolor rubber.
RELEVANT MATERIALS. Activated by basic accelerators and aldehyde amines.
PURPOSE AND FUNCTION. A relatively high-temperature latex accelerator. Imparts excellent aging quality to cured stocks.
METHODS OF USE. Add directly to latex mix.
VULCANIZATION. Flat curing range at relatively high curing range.
PATENTS. Not disclosed.

Accelerator 87

CHEMICAL COMPOSITION. A 50% water solution of potassium pentamethylene dithiocarbamate.
SELLER. E. I. du Pont de Nemours & Co., Inc.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Amber colored liquid.
PROPERTIES. Sp. gr., 1.19. Stability excellent, but should be stored in glass or iron. Non-toxic. Odorless. Does not discolor rubber.
RELEVANT MATERIALS. Is activated by thiuram, thiazole, and aldehydeamine types of accelerators.
PURPOSE AND FUNCTION. A very fast ultra-accelerator for curing latex at room temperatures and up. Has excellent aging properties.
METHODS OF USE. Add directly to latex mix.
VULCANIZATION. Has wide range of cure from room temperature up. Very fast and active at all curing temperatures.
PATENTS. Not disclosed.

Accelerator 122

CHEMICAL COMPOSITION. A 50% water solution of potassium salt of mercaptobenzothiazole and potassium pentamethylene dithiocarbamate.
SELLER. E. I. du Pont de Nemours & Co., Inc.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Amber colored liquid.
PROPERTIES. Sp. gr., 1.23. Stable, but should be stored in glass or iron. Non-toxic. Odorless. Does not discolor rubber.
RELEVANT MATERIALS. Is activated by thiuram and aldehydeamine types of accelerators.
PURPOSE AND FUNCTION. A very fast ultra-accelerator for curing latex at room temperatures and up. Has excellent aging properties.
METHODS OF USE. Add directly to latex mix.
VULCANIZATION. Has wide range of cure from room temperature up. Very fast and active at all curing temperatures.
PATENTS. Not disclosed.

Dispersed Ingredients

Black No. 25

CHEMICAL COMPOSITION. Channel black.
SELLER. Heveatex Corp.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Smooth flowing paste of dispersed channel carbon black.
PROPERTIES. Stable aqueous dispersion, 33 1/3% solids.
PURPOSE AND FUNCTION. Pigmenting latex compounds.
METHODS OF USE. Add directly to latex in required proportions.
VULCANIZATION. Delays cure slightly.
PATENTS. Not disclosed.

Colors (All Tints), Mineral

CHEMICAL COMPOSITION. Metallic oxides.
SELLER. Premier Mill Corp.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Paste, about 70% solids, 2 to 5 microns particle size.
PROPERTIES. Stable. Non-toxic. Insoluble.
PURPOSE AND FUNCTION. Color effects.
METHODS OF USE. Add directly to latex.
VULCANIZATION. Negligible effect on rate of cure.
PATENTS. Not disclosed.

Colors (All Tints), Organic

CHEMICAL COMPOSITION. Colloidal organic colors.
SELLER. Heveatex Corp., E. I. du Pont de Nemours & Co., Inc., General Dyestuff Corp., and Ansbacher-Siegle Corp.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Organic colors (in variety) dispersed as smooth flowing pastes.
PROPERTIES. Stable. Alkali resistant.
PURPOSE AND FUNCTION. Coloring all latex compounds.
METHODS OF USE. Add directly to latex in required proportions.
VULCANIZATION. Colors not changed. Some activate with certain accelerators.
PATENTS. Not disclosed.

Colors (All Tints), Pulp

CHEMICAL COMPOSITION. Organic pigments.
SELLER. Ansbacher-Siegle Corp.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Pulp form, about 20% solids.
PROPERTIES. Stable. Alkali resistant.
PURPOSE AND FUNCTION. Coloring latex products.
METHODS OF USE. Add directly to latex.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

[1] Continued from INDIA RUBBER WORLD, July 1, 1935, pp. 46-49.
[2] INDIA RUBBER WORLD, Apr. 1, 1935, pp. 28-29.

Dispersex 10

CHEMICAL COMPOSITION. Aqueous dispersion of cumar resin.
SELLER. Heveatex Corp.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Water miscible liquid.
PROPERTIES. Stable. Adhesive.
PURPOSE AND FUNCTION. Softener and tack producing agent.
METHODS OF USE. Add directly to latex and latex compounds.
VULCANIZATION. Negligible effect.
PATENTS. Not disclosed.

Dispersex 15

CHEMICAL COMPOSITION. Concentrated aqueous dispersion of cumar resin.
SELLER. Heveatex Corp.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Soft resin directly miscible in water.
PROPERTIES. Stable. Adhesive.
PURPOSE AND FUNCTION. Softener and tack producing agent.
METHODS OF USE. Add directly to latex and latex compounds.
VULCANIZATION. Negligible effect.
PATENTS. Not disclosed.

Dispersex 20

CHEMICAL COMPOSITION. Resin composition.
SELLER. Heveatex Corp.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Hard resin directly miscible in water.
PROPERTIES. Stable. Adhesive.
PURPOSE AND FUNCTION. Softener and tack producing agent.
METHODS OF USE. Add directly to latex and latex compounds.
VULCANIZATION. Negligible effect.
PATENTS. Not disclosed.

Emo, Brown

CHEMICAL COMPOSITION. Emulsified semi-vulcanized oils.
SELLER. Stamford Rubber Supply Co.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Brown colored liquid.
PROPERTIES. Stable. Non-toxic. Odorless.
PURPOSE AND FUNCTION. Smoothing out latex mixing and imparting improved finish to goods.
METHODS OF USE. Mix directly with latex in moderate proportions.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

Emo, White

CHEMICAL COMPOSITION. Emulsified semi-vulcanized oils.
SELLER. Stamford Rubber Supply Co.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. White liquid.
PROPERTIES. Stable. Non-toxic. Odorless.
PURPOSE AND FUNCTION. Smoothing out latex mixings and imparting improved finish to goods.
METHODS OF USE. Mix directly with latex in moderate proportions.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

Factice, Dispersed

CHEMICAL COMPOSITION. Dispersed rubber and vulcanized oils.
SELLER. Stamford Rubber Supply Co.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Dark colored liquid.
PROPERTIES. Stable. Non-toxic. Odorless.
PURPOSE AND FUNCTION. Improves resilience and finish of products.
METHODS OF USE. Mix directly with latex in moderate proportions.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

Stabilizers

Stablex A

CHEMICAL COMPOSITION. Sulphonated naphthalene derivative.
SELLER. Heveatex Corp.
APPLICATIONS. Latex compounding and impregnation of fibrous materials.
PHYSICAL STATE. Fine powder.
PROPERTIES. Non-toxic. Stable. Water soluble.
PURPOSE AND FUNCTION. Powerful wetting agent to reduce surface tension.
METHODS OF USE. Add in minute quantities to latex.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

Stablex B

CHEMICAL COMPOSITION. Sulphonated naphthalene derivative.
SELLER. Heveatex Corp.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Coarse powder.
PROPERTIES. Non-toxic. Stable.
PURPOSE AND FUNCTION. Stabilizing latex compounds.
METHODS OF USE. Water solutions added in small proportions greatly increase stability of latex compounds.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

Stablex C

CHEMICAL COMPOSITION. Sulphonated naphthalene derivative.
SELLER. Heveatex Corp.
APPLICATIONS. Latex compounding and impregnation of fibrous materials.
PHYSICAL STATE. Liquid.
PROPERTIES. Non-toxic. Stable. Water soluble.
PURPOSE AND FUNCTION. Powerful wetting agent for reducing surface tension.
METHODS OF USE. Add in minute quantities to latex.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

Thickeners

Acacia or Gum Arabic

CHEMICAL COMPOSITION. Dried gummy exudation from stems and branches of *Acacia Senegal*.
SELLER. American Cyanamid & Chemical Corp.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. White powder, 120 mesh.
PROPERTIES. Non-toxic. Stable. Insoluble in alcohol, but almost completely soluble in twice its weight of cold water. The solution is acid to litmus paper.
PURPOSE AND FUNCTION. Latex thickening and dispersing agent.
METHODS OF USE. Add directly to latex.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

Amalg

CHEMICAL COMPOSITION. Ammonium alginate.
SELLER. Feedwaters, Inc.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Colloidal sol.
PROPERTIES. Non-toxic. Stable. Mucilaginous.
PURPOSE AND FUNCTION. Latex thickening, stabilizing, and creaming.
METHODS OF USE. Add directly to latex.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

Carob Flour

CHEMICAL COMPOSITION. Natural vegetable product.
SELLER. Kem Products Co., Inc.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. White powder, approximately 100 mesh.
PROPERTIES. Non-toxic. Stable.
PURPOSE AND FUNCTION. Latex thickener, introducing minimum non-rubber solids.
METHODS OF USE. Add directly or as aqueous paste to latex.
VULCANIZATION. Believe no effect.
PATENTS. Not disclosed.

Casein

CHEMICAL COMPOSITION. By-product from cow's milk.
SELLER. Innis, Speiden & Co.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. White or slightly yellow granular powder.
PROPERTIES. Insoluble in water and other neutral solvents; readily soluble in ammonia water and alkaline hydrates forming a cloudy solution.

PURPOSE AND FUNCTION. Thickening and stabilizing latex.
METHODS OF USE. Add directly to latex.
VULCANIZATION. Negligible effect.
PATENTS. Not disclosed.

Indian Gum

CHEMICAL COMPOSITION. The dried gummy exudation from *Astragalus gummifer* or some other Asiatic species of *Astragalus.*
SELLER. Innis, Speiden & Co. and American Cyanamid & Chemical Corp.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. White powder or flake form.
PROPERTIES. Taste insipid. Inodorous. Mucilaginous.
PURPOSE AND FUNCTION. Thickening and creaming agent for latex.
METHODS OF USE. Add directly to latex.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

Karaya Gum

CHEMICAL COMPOSITION. A natural vegetable product.
SELLER. Innis, Speiden & Co. and Frank-Vliet Co.
APPLICATIONS. Latex compounding.
PHYSICAL STATE. Light tan powder, about 175 mesh.
PROPERTIES. Non-toxic. Stable.
PURPOSE AND FUNCTION. Thickening latex.
METHODS OF USE. Add directly to latex.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

Locust Bean Gum

Same as Carob Flour, which see.

Tragacanth Gum

Known also as Indian Gum, which see.

Wetting Agents

Alphasol-OS

CHEMICAL COMPOSITION. Not disclosed.
SELLER. American Cyanamid & Chemical Corp.
APPLICATIONS. Latex compounding and impregnating fibrous materials.
PHYSICAL STATE. Fine powder.
PURPOSE AND FUNCTION. Wetting agent for dispersing pigments and assisting penetration into fabrics and fibers.
METHODS OF USE. Add directly to latex or to pigments for dispersive effect.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

Dispersaid

CHEMICAL COMPOSITION. Specialized combination of the higher alcohols.
SELLER. Binney & Smith Co.
APPLICATIONS. Latex compounding and dispersion of carbon black in rubber compounding.
PHYSICAL STATE. Light cream-colored powder.
PROPERTIES. Non-toxic. Soluble in water. Comparatively free from dissociation. The pH value of aqueous solutions is on the alkaline side.
PURPOSE AND FUNCTION. Wetting out fabrics for impregnation with latex and the dispersion of pigments in latex or other aqueous suspensions.
METHODS OF USE. Add about 5% of Dispersaid, on the dry pigment, or 0.5% on the solution.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

Igepon, AP Extra

CHEMICAL COMPOSITION. Fatty ester of a sulphonated aliphatic compound.
SELLER. General Dyestuff Corp.
APPLICATIONS. Tire carcass, footwear, belting, packing, hose, druggists' sundries, also textiles, paper, and general compounding.
PHYSICAL STATE. Fine light-yellow powder.
PROPERTIES. Stable. Non-toxic. Water soluble.
PURPOSE AND FUNCTION. Wetting, penetrating, and general emulsifying agent. Protective colloid action against coagulation.
METHODS OF USE. Solution in latex. Treatment of materials before latex application.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

Nekal BX

CHEMICAL COMPOSITION. Naphthalene sulphonate derivative.
SELLER. General Dyestuff Corp.
APPLICATIONS. Tire carcass, footwear, belting, packing, hose, druggists' sundries, also textiles, paper, and general compounding.
PHYSICAL STATE. Fine light-yellow powder.
PROPERTIES. Stable. Non-toxic. Water soluble.
PURPOSE AND FUNCTION. Penetrating agent, pigment dispersion, and wetting.
METHODS OF USE. Solution in latex. Treatment of materials before latex application.
VULCANIZATION. No effect on rate of cure.
PATENTS. Not disclosed.

Addenda—Dry Compounding Accelerators

Zenite

CHEMICAL COMPOSITION. Zinc salt of mercaptobenzothiazole.
SELLER. E. I. du Pont de Nemours & Co., Inc.
APPLICATIONS. All-purpose accelerator. Can be used for all types of compounds and cures.
PHYSICAL STATE. Fluffy yellow powder.
PROPERTIES. Sp. gr., 1.42. Decomposes on heating. Insoluble in most solvents. Stability excellent, does not absorb moisture or volatilize during storage or use. Non-toxic. Practically odorless. Disperses well in rubber. Does not bloom or discolor rubber and may be used in white stocks.
RELEVANT MATERIALS. Stearic acid is necessary for activation of Zenite. From 1 to 2% stearic acid should be used in all types of compounds except in those heavily loaded with reenforcing pigments which require 3 to 4% on the rubber. Activated by guanidines, aldehydeamines, and thiuram accelerators.
PURPOSE AND FUNCTION. A fast curing accelerator which can be handled with safety at normal processing temperatures. Imparts good aging to stock.
METHODS OF USE. Add directly to rubber.
VULCANIZATION. Has broad and flat curing range and provides active acceleration at curing temperatures of 126° C. (259° F.) and above.
PATENTS. Not disclosed.

Zenite A

CHEMICAL COMPOSITION. A mixture of 97% Zenite and 3% Thionex.
SELLER. E. I. du Pont de Nemours & Co., Inc.
APPLICATIONS. General purpose accelerator.
PHYSICAL STATE. Pale yellow powder.
PROPERTIES. Sp. gr., 1.40. Decomposes on heating. Insoluble in most solvents. Stability excellent, does not absorb moisture or volatilize during storage or use. Non-toxic. Practically odorless. Does not bloom or discolor rubber and may be used in white stocks. Disperses well in rubber.
RELEVANT MATERIALS. Stearic acid is required for activation of Zenite A. From 1 to 2% stearic acid should be used in all types of compounds except in those heavily loaded with reenforcing pigments which require 2 to 3% on the rubber.
PURPOSE AND FUNCTION. General purpose accelerator, very safe to handle at processing temperatures. Zenite A stocks age well.
METHODS OF USE. Add directly to rubber.
VULCANIZATION. Has broad and flat curing range and provides active acceleration at curing temperatures of 126° C. (259° F.) and above.
PATENTS. Not disclosed.

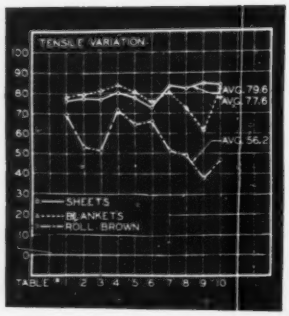
Zenite B

CHEMICAL COMPOSITION. A mixture of 90% Zenite and 10% D.O.T.G.
SELLER. E. I. du Pont de Nemours & Co., Inc.
APPLICATIONS. General purpose accelerator.
PHYSICAL STATE. Pale yellow powder.
PROPERTIES. Sp. gr., 1.39. Insoluble in most solvents, but partially soluble in alcohol and benzol. Stability excellent, does

(*Continued on page* 41)

Studies on Variability o

A. E. Warner [2]

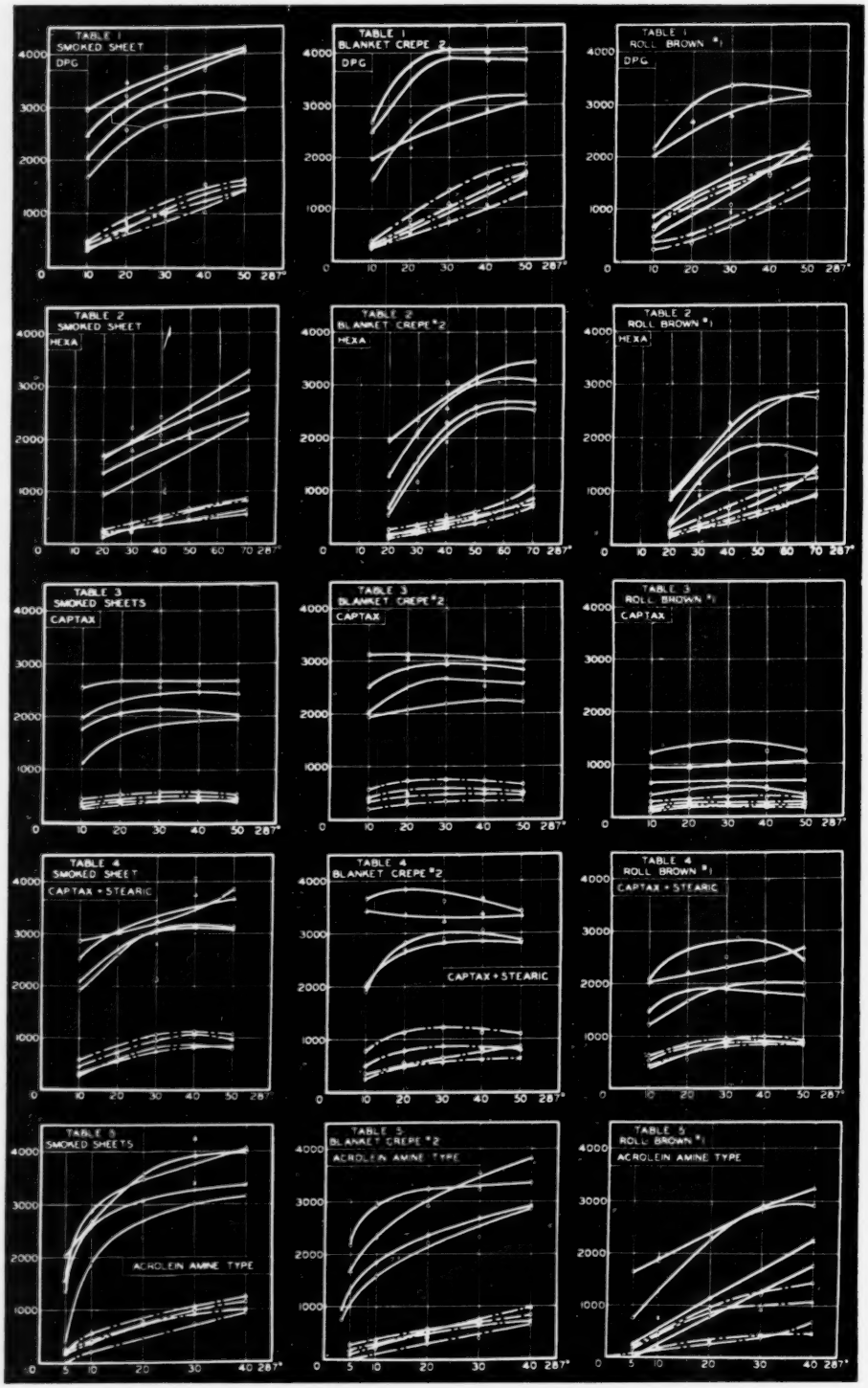


ANY one interested in or associated with the rubber industry is quite sure to become interested, sooner or later, in rubber itself. It is indeed a product of nature which has come to serve man's need in an ever-increasing range. To those who have seen the transition from wild rubbers to plantation sorts, from inorganic to organic accelerators, from the 3,500-mile tire to the present-day tire, there is a genuine appreciation of the unique properties of rubber. To the constantly increasing number who have had the opportunity to visit the plantations, the experimental stations, the godowns and auctions, there is some appreciation of the many factors which contribute to the variation in rubber. A plantation industry which has grown in thirty-odd years from less than one hundred tons' to 800,000 tons' annual production is bound to be still afflicted with growing pains.

The literature on the variability of rubber is fairly

[1] Paper read at meeting of the Rubber Division, A. C. S., New York, N. Y., Apr. 22-23, 1935.

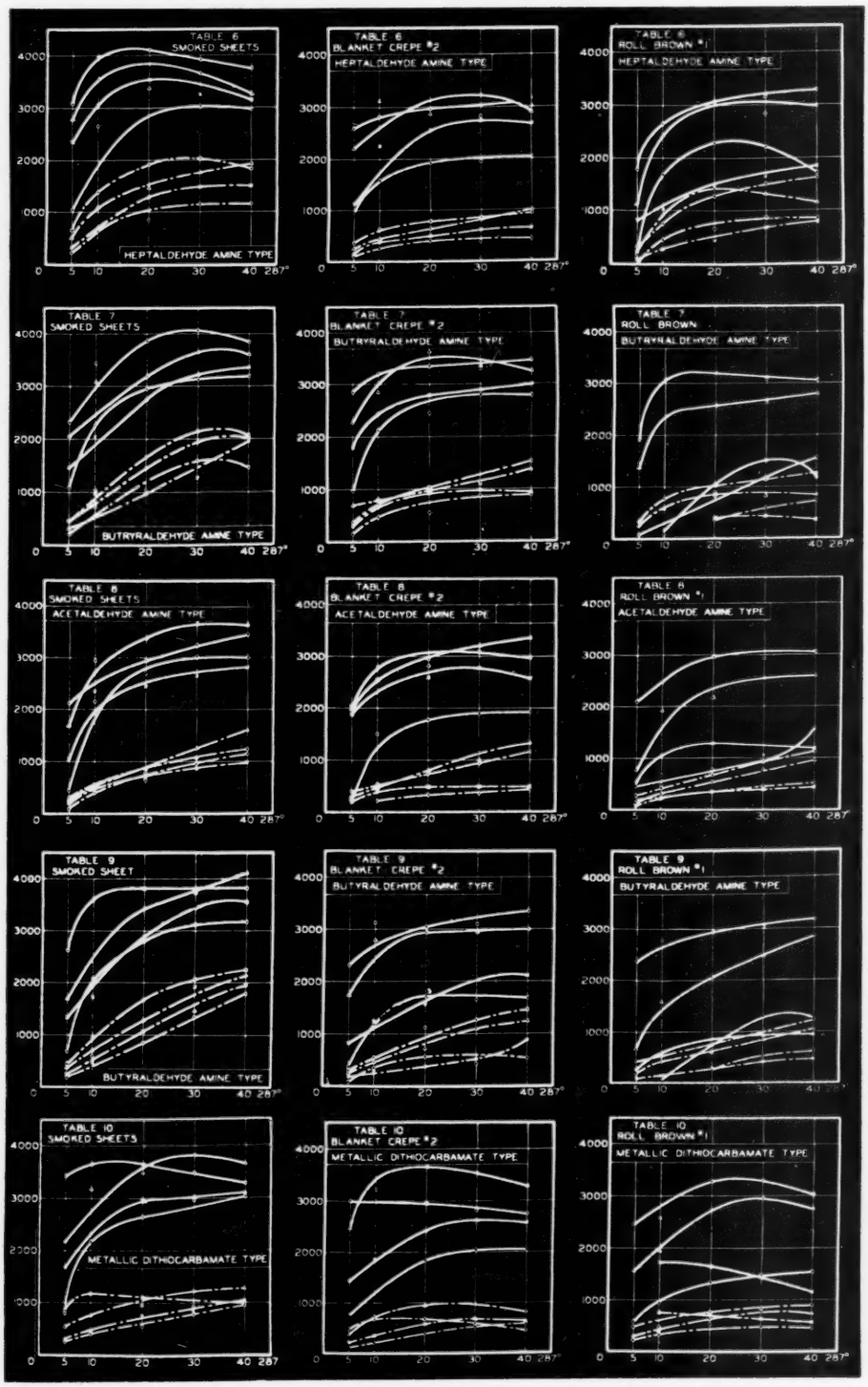
[2] Chief chemist, C. P. Hall Co., Akron, O.

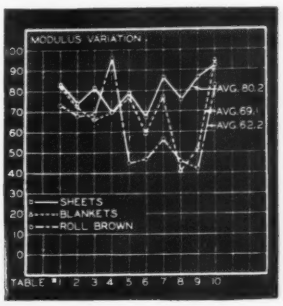


Tables 1 to 10 show that the variability of crude rubber is accentuated as the grades lower and that accelerators do not eliminate such variations.

tyof Plantation Rubber[1]

extensive. Eaton,[3] of F. M. S., and DeVries,[4] of Java, are among the early publishers from the plantation point of view. Bishop and Fullerton[5] in 1932 examined sheet rubber, using both rubber sulphur and accelerated mixes. Their summary reads in part:





"An examination of samples of sheet rubber collected at a recent exhibition discloses a high degree of variation in the vulcanizing properties of the rubber. . . .

"Similar variation in the normal produce of first-class estates are recorded. Other properties of rubber, such as plasticity, may be expected to show similar variability."

That such variability is encountered in manufacturing, Young and Ruch[6] cite serious difficulty due to wide variation in plasticity of sheets.

As representative of the present-day view on the subject based on work having the benefit of up-to-date knowledge of organic accelerators, George A. Sackett[7] gives his conclusion:

"The variability will not probably be overcome by the plantations and the consumer of crude rubber must bear the burden of eliminating most of the variables himself."

In the present work three grades: viz., sheets, No. 2 amber crepe, and roll bark

[3] "Variation of Plantation vs. Fine Para." Eaton and Grantham, *J. Soc. Chem. Ind.*, 34, 989 (1915).

[4] Much work done by DeVries in Java. *Arch. Rubbercultuur*, 1, 25 (1917); 1, 169 (1917): 4, 313, 331 (1920). "Plantation—Estate Rubber," Ruygro K & Co., Batavia, 1920.

[5] *Rubber Chem. Tech.*, 5, 4, 509-22 (Oct., 1932).

[6] *Trans. Inst. Rubber Ind.*, IX, 5, J-27, (1934).

crepe were examined. A simple basic formula was used consisting of:

Rubber	100
Sulphur	3
ZnO	10

Nine different accelerators in more or less common commercial use were selected. With each of these accelerators ten distinct lots of each of the three grades were tested. There is no comparison of the accelerators possible, as care was used to mix no single lot of rubber with more than one accelerator. The tables and graphs presented show the results of four lots for each of the three grades and with each of the accelerators. The two lots showing the highest and the two lots showing the lowest values were selected. Three hundred lots were tested in the complete series. Testing conditions, affecting physical properties measured, were given due consideration.

Averaging all cures of the twenty low lots against the twenty high lots of the sheets tested, and doing the same for the ambers and roll brown, shows the ambers having slightly greater variation than the sheets. The roll brown grade shows much the greater variation in both tensile and modulus.

By selecting the cure showing best tensile for each lot tested with each accelerator, designating the average of the two high tests as 100, showing the two low lots on proportional percentage basis and treating the corresponding modulus figures on the same basis, then taking an average for the ten lots of each, sheets, ambers, and roll brown, we get the following comparison:

	Maximum	Minimum	Average
Sheets			
Tensile	84.3	73.1	79.6
Modulus	94.	66.8	80.2
Amber			
Tensile	84.	61.4	77.6
Modulus	82.7	40.6	69.1
Roll Brown			
Tensile	71.8	37.9	56.2
Modulus	96.	42.	62.2

Variation must be eliminated by some means other than organic accelerators. Even with high-grade rubbers there is a substantial variation with all organic accelerators tested.

This variation is markedly accentuated with lower grades of rubber. Modulus does not necessarily correspond with tensiles, i.e., high tensile rubber may have low modulus and vice versa.

The significance of this marked variation to the performance of various products is not well established. Dinsmore,[8] however, has shown that low modulus rubbers gave both solid and pneumatic tires with less resistance to blowout than found with higher modulus lots.

More work along this line is desirable so that we may better understand this problem of variation and its real meaning to the industry.

Acknowledgment is extended to the following companies for kindly supplying rubber samples: The Firestone Tire & Rubber Co., The Inland Mfg. Co., India Tire Co., The Mohawk Rubber Co., The C. P. Hall Co. of California, representing the H. A. Astlett Co. in California.

Table		Sort	Tensile Index			Modulus Index		
I		SS	76.4			83.5		
	DPG	Amb		78.2			82.7	
		RB			69.6			72.7
II		SS	77.8			73.7		
	HEXA	Amb		79.8			74.5	
		RB			53.5			67.6
III		SS	77.2			81.7		
	Captax	Amb		81.5			66.	
		RB			51.7			68.6
IV		SS	80.3			74.8		
	Captax + Stearic	Amb		84.			69.4	
		RB			71.8			96.
V		SS	78.			79.		
	Acrolein + Amine	Amb		80.6			76.7	
		RB			64.8			44.6
VI		SS	73.1			66.8		
	Heptaldehyde + Amine	Amb		75.8			59.	
		RB			66.			46.8
VII		SS	83.7			86.7		
	Butryraldehyde + Amine	Amb		80.4			76.4	
		RB			51.4			56.5
VIII		SS	82.2			75.7		
	Acetaldehyde + Amine	Amb		72.4			40.6	
		RB			49.			45.2
IX		SS	84.3			86.4		
	Butryraldehyde + Amine	Amb		61.4			51.8	
		RB			37.9			42.
X		SS	83.9			94.		
	Metallic Dithiocarbamate	Amb		82.2			94.2	
		RB			46.8			82.1
	Average		79.7	77.6	56.2	80.2	69.1	62.2

[7] "Studies of Crude Rubber Variation." Geo. A. Sackett, *Ind. Eng. Chem.*, 26, 5, 533-40 (May, 1934).

Statement occurs in paper by Sackett: "This investigation was made to study this point more fully and Captax (mercapto benzothiazole) was used as accelerator, not only for the reason already given, that the rubber from this plantation was to be used with Captax in manufacture, but also because this material is more sensitive to slight variations than other accelerators."

Recipe he used was:

Rubber	100.
ZnO	4.
S	6.
Captax	0.5

Used no stearic acid. Cure was 40 minutes at 260° F.

[8] India Rubber World, 76, 6, 77-78 (Mar. 1, 1929).

Latex Reversible Compositions[1]

THE process for latex reversible compositions relates to the flocculation of rubber latex to produce reversible rubber flocs which, after they have been dewatered to a comparatively low moisture content, are caused to revert to rubber latex. A specific example of procedure follows. To about 1,000 pounds of ammonia-preserved latex of about 40% solids content are added, with stirring, about 300 pounds of a 10% caseinate solution. The caseinate solution may be prepared by swelling dry casein in water, adding sufficient ammonia water to form ammonium caseinate, stirring until free from lumps, and diluting to 10% strength. The latex-caseinate mixture is preferably diluted to about 20% solids content to avoid tendency toward the formation of large rubber flocs when a suitable flocculating agent is added. To the diluted latex-caseinate mixture are then gradually added, with stirring, about 2,000 pounds of a 1% solution of zinc chloride in water preferably containing a trace of acetic acid. This amount of zinc chloride insures complete flocculation of the latex, the zinc chloride not only functioning as a flocculating agent, but also as an insolubilizer of the stabilizer with which it undergoes a metathetical reaction to form the insoluble zinc caseinate. The insolubilized stabilizer envelops the ultimate rubber particles of the latex, which aggregate and coalesce into flocs as the stabilizer surrounding them is being insolubilized. The slurry of rubber flocs thus produced is then dewatered, as in a filter press or centrifugal filter, until a cake or semi-solid mass of about 70% solids content is realized. The mass is of a consistency similar to that of cottage cheese and easily falls apart under rubbing or shearing action to yield pellets. It is not readily wetted by water, but when treated with ammonia water, it reverts to an aqueous rubber dispersion of the nature of the original latex.

[1] U. S. patent No. 1,995,747, Mar. 26, 1935.

Plant Handling of Latex[1]

Increasing Commerce in Latex—Quality Supervision—Transportation—Storage—Bulking—Grading—Processing

OFFICIAL statistics show that latex importations into the United States rose from 10,414,712 pounds in 1931 to 29,276,134 pounds in 1934 and at a still greater rate for 1935. An idea of the magnitude of the investments required and labor necessary in the production of latex, now being widely utilized for many industrial purposes, can be obtained if it is considered that on many plantations the yield per year per acre is only about 150 to 200 gallons and that an average rubber tree will only yield approximately 20 pounds of latex per year, tapping every second day.

[1] Data and illustrations through courtesy of Heveatex Corp., Melrose, Mass.

Thorough Control Required

It is now very generally realized that latex, as taken from the trees, is a variable substance; therefore control of its quality from plantation to consumer is of utmost importance and involves special precautions to secure most satisfactory processing results. Many rubber estates in the Far East have no special equipment to handle latex and merely ship a small portion of their crop as latex;

Figs. 1 and 2. Plant of Heveatex Corp., Melrose, Mass. Figs. 3, 4, and 9. View of Siding and Cars for Latex Transportation. Figs. 6 and 7. Two Prepared Material Warehouses. Figs. 5 and 8. Batteries of Air-Fitted Bulking Tanks. Fig. 10. Processing Department. Figs. 11, 12, and 13. Compounding and Bulking Operations. Fig. 14. Colloid Mill. Figs. 15 and 16. Various Types of Ball Mills. Fig. 17. Grinding and Mixing Machinery. Fig. 18. General Compounding Department with Variable Speed Automatic Mixer in Foreground. Fig. 19. Materials Control Laboratory. Fig. 20. One of the Two Development and Research Laboratories.

whereas the balance is turned into sheet or crepe in the usual way. It will be readily understood, therefore, that latex obtained from such sources with their small bulking facilities of only 100 to 500 gallons and in intermittent shipments can hardly be considered suitable for continuous manufacturing operations which are subject to close control, although it might be suitable for some minor purposes. Although many improvements have been made in the Far East during the past few years, the perfection of these methods in the standardizing of latex has been left to the initiative of large importers, such as the Heveatex Corp., which receive, bulk, grade, and inspect latex received from various estates and deliver it as a uniform material to meet consumers' requirements. In many cases exacting specifications, such as total solids, dry rubber content, alkalinity, viscosity, surface tension, stability, etc., once established minimize variations for the service of manufacturers who require a continuously uniform latex suitable for their particular machines or operations.

Specification control limits are met by a specific bulked lot of latex. This bulking is then earmarked for exclusive shipments. Before the specific bulk lot is exhausted checks and tests are made on comparable new lots, and samples of those found satisfactory are submitted to the manufacturer for approval, and deliveries are continued from such approved new bulkings. Thus continuity of uniform manufacture can be depended upon, and considerable savings are effected by avoiding variations in the final manufactured product, plant shutdowns, etc.

Control in the Far East

Heveatex Corp. now has an established organization in the Far East taking the entire output of several estates. This work in the East is in charge of R. O. Bishop, formerly head of the Chemical Division of the Rubber Research Institute of Kuala Lumpur, who has had 17 years of experience in the East and is a recognized authority on technical matters pertaining to latex and estate practice. Mr. Bishop, with headquarters in Singapore, has technical control of all shipments made to the Heveatex Corp. For the most part shipments are made from estates which concentrate their entire activities on latex and have installed special equipment consisting of large bulking tanks of 10,000 to 20,000 gallons size. These bulking and settling tanks represent the first step in the removal of sediment and foreign matter which are unavoidably included during the collection and ammoniation of latex. Great care is taken in the estate handling and in the proper lining of all containers to prevent contamination with iron.

Shipments forwarded by the Far Eastern steamers arrive at the docks in Boston, where they are transferred to railroad cars in which they are transported to the company's plant (Figures 1 and 2) under a "storage in transit" arrangement. Under this plan stored latex, when shipped out within one year, is carried at the import freight rate. That is to say, the freight rate is the same as would have applied had the shipment been dispatched ex-steamer direct to destination.

The Heveatex Corp. has a private siding directly on the main line of the Boston & Maine Railroad (Figures 3, 4, and 9) where tank and box car shipments of latex can be easily handled. Small local shipments are delivered by truck to the surrounding area.

Storing, Bulking, and Processing

Latex is a very bulky commodity to store. It not only requires large spaces for storing the prepared material, but also necessitates the most modern facilities for handling large quantities of new and in-process latex with a minimum of labor and exposure. Warehouses, illustrated in Figures 6 and 7, occupy more than 100,000 square feet of floor space suitable to carry a multitude of heavily loaded drums. Several batteries of huge tanks, Figures 5 and 8, equipped with agitating devices and fitted with air connections are utilized in the bulking and processing operations. Other batteries, not illustrated, of 40,000- and 80,000-gallon size are suitably located to serve as latex storage and as a station through which latex can be transferred from the siding to the processing tanks, or bulk processed material conveyed into tank cars for shipment to the customer. In either case the materials undergo another step in the important bulking procedure. The intercommunication of these various batteries permits movement of the latex or processed material in any desired way by means of proper valve manipulation and application of 10 to 15 pounds of air pressure.

The layout of the processing department is essentially that of a typical chemical plant. (Figure 10.) Latex which is to be concentrated, compounded, or processed is first blown by air pressure into elevated tanks from which it flows by gravity to the processing or concentrating and compounding stations located at an intermediate point on a balcony (Figures 11, 12, and 13), where the prepared material is again delivered into final bulking tanks from which it is drawn off into shipping drums.

Apparatus for Preparation of Compounding Ingredients

Considerable space in the plant is given over to the preparation of various materials for compounding. The equipment used for these purposes are various types of grinding machinery, colloid mills, paint mills, mixing machinery, etc. (Figures 14, 15, 16, 17, and 18.) The gravity principle is employed in all stages of latex handling.

Chemical Control

Three chemical laboratories are in the Heveatex plant. One of them is for factory control in which all incoming and outgoing materials are checked, tested, and recorded. The other two are for development and research work. (Figures 19 and 20.) As the use of latex is comparatively new, it is necessary constantly to carry on research and development work directed principally to new uses in which latex may be applied and also to perfect products and processes now in use. Considerable space is also devoted to the mechanical development of appliances and machines for the manufacture of various articles from latex. Much of this work is conducted in collaboration with consumers of latex.

Properties of Cellular Rubber

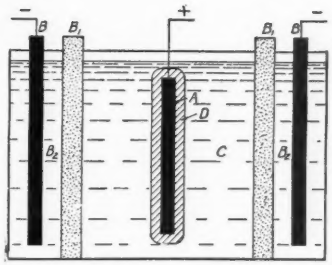
(*Continued from page* 28)

gredients and vulcanizing agents are used which do not impart characteristic or objectionable odors.

The object of this paper is to present the properties of cellular rubber which are of value to improve the riding comfort of automobile seats. Another application of this material is for the back cushions of automobile seats. A reduction in the depth of a cushion is possible with the consequent saving in space and increased riding comfort. Its use is growing rapidly due to the ability of this material successfully to meet various requirements of seat cushions for the various transportation systems.

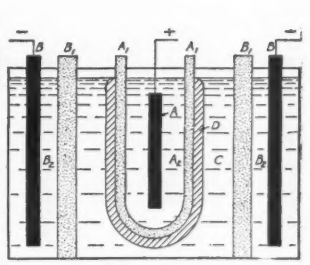
The Anode Process[1]

IN 1906 at the Sorbonne University, Paris, France, Professor Henri discovered that the electric charge of rubber latex particles travels toward the positive pole when a direct electromotive force is applied. From this basic discovery the two principal methods of the anode process for producing rubber articles and coatings were developed. They were among the earliest of latex technology, a field which is undergoing rapid development because of its distinctive advantages and new applications of rubber. The two methods of the anode process are (1) electrochemical deposition, or the anode electrodeposition process; and (2) electrical-chemical deposition, or the anode ionic deposition process. They are discussed in four basic United States patents.[2] Explanations of these methods are here quoted with diagrams from an article[3] by one of the patentees.



A. Anode with deposit of latex rubber. B. Cathodes. B_1. Cathode diaphragm. B_2. Cathode compartment. C. Latex mix. D. Deposited rubber.

Fig. 1. Cell for Anode Electrodeposition on Metal



A. Anode. A_1. Anode diaphragm with deposit of latex rubber. A_2. Anode compartment. B. Cathode. B_1. Cathode diaphragm. B_2. Cathode compartment. C. Latex mix. D. Deposited rubber.

Fig. 2. Cell for Electrodeposition on Porous Forms

Anode Electrodeposition

A latex mix adjusted for anode electrodeposition may, for example, contain 35% by weight of rubber and compounding ingredients, about 20 grams per liter of ammonia, and about 30 grams per liter of ammonium, potassium, and sodium salts, the majority of which is ammonium chloride. The latex mixture is placed in the anode compartment of a diaphragm cell, Figure 1. Slightly alkaline water is placed in the cathode compartment. An anode of zinc or galvanized iron is inserted into the latex, and a cathode is placed in the cathode compartment. When a unidirectional electromotive force is impressed across the electrodes, a number of phenomena takes place.

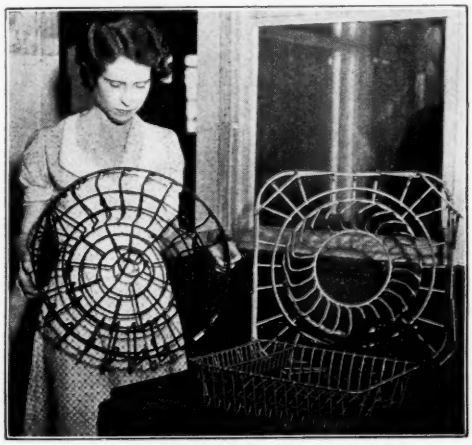


Fig. 3. Fan Guards and Draining Rack

The negatively charged particles of rubber and compounding ingredients exhibit electrophoretic movement in the direction of the anode, bringing about a higher concentration of solids in the immediate neighborhood of that electrode. During this process the anode removes water from the wet coagulated deposit by electroendosmotic action and compacts the deposit until it contains about 40% water. This water content is sufficient to maintain the electrolytic conductivity of the deposit and permit the deposition to continue. Thus anode electrodeposition may be used for the continuous production of deposits having 60% total solids from a mix containing 35% total solids without depleting the mix.

Permeable Materials

When an anode is immersed into an electrolyte, such as a water solution of a divalent metallic salt, and this electrolyte is separated from the latex by permeable material (an anode diaphragm), the application of a direct electric current across the cell, Figure 2, will result in the formation of a deposit of coagulated rubber upon such a diaphragm or membrane.

Anode Ionic Deposition

In anode electrodeposition from concentrated mixes, electrophoretic and electroendosmotic action are incidental to, rather than vital to, the coagulation of deposits. In such deposition the applied electric potential fulfills the primary function of causing coagulating ions to migrate from an anode surface or from the anode compart-

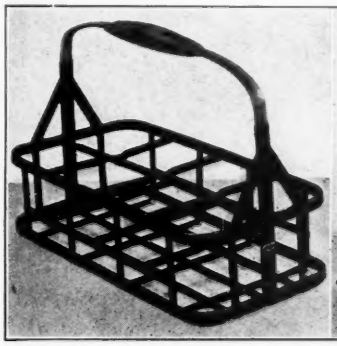


Fig. 4 Noiseless Bottle Carrier

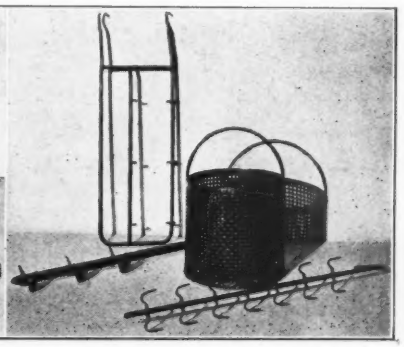


Fig. 5. Plating Racks and Dipping Basket

[1] Printed through the courtesy of American Anode, Inc., Akron, O.

[2] Sheppard and Eberlin, 1,476,374, Dec. 4, 1923; Klein, 1,548,689, Aug. 4, 1925; Sheppard and Beal, 1,589,325, June 15, 1926; Klein and Szegvari, 1,825,736, Oct. 6, 1931.

[3] "Anode Process for Rubber Articles and Coatings." C. L. Beal, *Ind. Eng. Chem.*, June, 1933, p. 609-13.

ment of a diaphragm cell to coagulate negatively charged particles into useful deposits of latex rubber. It is clearly obvious that if coagulating ions were allowed to diffuse from surfaces or through permeable materials into a concentrated latex mix, the same result would be accomplished, but at a considerably different rate. Accordingly there has been developed, simultaneously with electrodeposition, a process in which the coagulating ions are provided directly by chemicals and without electrochemical action, and in which the streams of coagulating ions are impelled outward from the depositing surface by osmotic pressure rather than by an applied electric potential. This process has been termed "anode electrical-chemical" or "ionic deposition."

Equipment such as that illustrated in Figure 2 for electrodeposition on porous diaphragms may also be used for ionic deposition, but in such case no external source of electric current and no cathode diaphragm are required.

Physical Properties

Average tensile and elongation data on several high-quality anode rubber stocks are shown in Table 1, and stress-strain data on a typical anode compound in Table 2.

Table 1. Anode Pure Rubber Stocks

Compound	Tensile (Lb./Sq. In.)	Elongation
A	5,943	973
B	5,120	955
C	5,500	930
D	6,695	905
E	6,890	860
F	6,003	843

Table 2. Stress-Strain Data on a Typical Anode Compound

Elongation %	Pull Lb.
100	80
200	120
300	140
400	180
500	280
600	675
700	1,525
800	2,650
900	4,500
930	5,500

Anode rubber has very high resistance to tearing and excellent aging. High-grade commercial stocks often test 3,500 pounds per square inch after 21 days in the Geer oven at 70° C. (158° F.) or after 144 hours in the Bierer-Davis bomb at 70° C. (158° F.) and 300 pounds' per square inch oxygen pressure.

The superior resistance of hard and soft anode rubber to most acids at temperatures less than 65 to 77° C. (150 to 170° F.) is advantageous when rubber coatings are used for such articles as are pictured in the illustrations, which include racks, guards, dipping baskets, etc., as produced commercially in the plant of American Anode, Inc., Akron, O. The resistance of anode rubber to abrasion makes it ideal for use in screening gravel and the wet handling of abrasive materials.

Para-Graphs

MICROPOROUS MOLDED RUBBER. Microporous articles from aqueous dispersions of rubber materials are formed by filling the dispersion into a mold of the desired shape when the dispersion gels. It is then vulcanized under conditions that prevent the escape of the water dispersed in the network of rubber material of the gel. In this way the structure of the microscopic network of the gel is preserved and fixed in a permanent form by vulcanizing. Thereafter the contained water is permitted to evaporate, leaving microporous pores in the space occupied by the water during vulcanization.

Crinkled Surfaces. The following method is designated for producing a crinkled surface on rubber articles from latex form-dipping processes. The form having the latex coating applied in any convenient manner is dipped into a latex coagulant in an aqueous medium through a thin layer of swelling agent floating on the surface of the coagulant bath and substantially immiscible with the bath so that the form is completely immersed in the subnatant latex coagulant. As the form surfaced with latex is dipped into the coagulant bath, it goes through the thin layer of swelling agent floating on top of the bath, and when the coagulant underneath acts to coagulate the latex on the surface of the form, a wrinkled surface is produced. A typical latex dipping compound suitable for the process follows:

Rubber as creamed latex 59.75% concentration	100.00
Water in creamed latex	67.40
Stabilizer	1.25
Formaldehyde (40% formalin)	4.75
Sulphur	2.50
Glue	0.10
Zinc oxide	1.00
Antioxidant	0.35
Sodium silicate	0.50
Accelerator	2.00

Rubber Solvent. The liquid organic sulphides, including both the disulphides and the thio-ethers, and characterized (in contrast with the mercaptans) by being substantially non-corrosive, possess excellent properties as solvents for rubber. Solutions of rubber in the above liquid organic sulphides are less viscous than solutions containing the same concentration of rubber in carbon disulphide. The mixtures of the organic sulphides as prepared from the mercaptans occurring in the distillation or destructive distillation products of petroleum and other naturally occurring hydrocarbons are especially suitable as rubber solvents, and these mercaptans provide very convenient and cheap sources for such solvents.

Rubber Reclaiming Process. The customary alkali rubber reclaiming process is modified by inclusion of a proportion of calcium hypochlorite for the purpose of dissolving out the cellulose present. The calcium hypochlorite containing 70% of available chlorine is added to the usual charge consisting of scrap, caustic soda, softeners, and water in proportions varying up to 25 pounds of hypochlorite to 4,500 pounds of scrap. The addition of the hypochlorite increases the rate at which the cellulose is dissolved as well as softens the rubber in spite of the effect of the presence of accelerators.

Latex Mixing for Molding. A typical mix for use in a process for making cast rubber shoes and other open hollow articles follows.

The concentrated latex sold under the trade mark "Revertex"	grs.	1,300
Zinc carbonate	grs.	150
Sulphur	grs.	30
Zinc diethyl dithiocarbamate	grs.	10
Water	cc.	415

This mix is rendered unstable by the addition of 230 cc. of a 30% ammonium nitrate solution, and the resultant mixture is poured into a mold. To obtain the quick setting which is so desirable, the mold should be heated to, for example, 80 to 90° C. (176 to 194° F.). If, however, cold setting is desired, the proportion of the setting agent should be increased, for example, by taking 380 cc. of a 71% ammonium nitrate solution.

The Foreman's Job

Getting and Holding the Worker's Interest

G. F. Buxton[1]

A SATISFACTORY worker in a manufacturing plant must combine two groups of qualifications, and he should rank high in both groups. In the first place he must know the job itself. He must have the necessary information directly connected with the job. He must understand the requirements from both production and inspection standpoints. He must have the proper mechanical or trade judgment which enables him to determine readily when production is being handled correctly. And he must have the manipulative skills and working habits which control both quality and speed in getting out the work.

In the second place he must have the right attitude toward the job. He should be interested in what he is doing and feel pleased with the ordinary, every-day activities to which he is assigned. He should unhesitatingly and with a feeling of real interest put his energy and best efforts into his work. He should be loyal to the company that hires him and anxious to do what he can to promote the company's welfare and its continued success.

Skill versus Interest

Both skill at the machine and a liking for the work are important. Foremen frequently say that if they had to choose between having a highly skilled but dissatisfied employe and a less skilled but interested employe, they would choose the one who had the greater interest and then would attempt to build up the necessary skill. They have the correct idea that improving the technical and manipulative ability of the employe is easier and surer than changing an undesirable attitude, especially when it represents a lack of interest or a leaning in the wrong direction with an antagonism toward the job. Developing standard motion habits is a simpler task than developing a good team spirit if the employe has allowed himself to become a chronic objector to every proposal.

In a previous issue[2] were discussed the building of skills and the general factory training problem of developing an efficient routine ability on the part of the employe. In this issue is discussed building interest as a complementary part of the foreman's teaching job. To the employe's ability to do the job must be added a willingness to do it satisfactorily. This liking for the work and taking a pride in doing it well are so important that the foreman must consider the need of getting the right attitude toward the work as a major responsibility in his dealing with workers.

It may be hard to say whether interest or understanding or judgment or skill is the most important thing to develop. We need them all and must see that all are present. But here we are discussing "interest" and its relation to production efficiency.

The Meaning of Interest

Interest is agreeable feeling. It suggests some kind of pleasure or satisfaction with what is happening. It varies with individuals, but is always a matter of feeling rather than of reason. There must be a certain amount of attraction or pull toward the person or thing which interests one. Sometimes an adequate interest seems to be present in an employe regardless of anything the foreman has done or may plan to do. At other times it seems to be absent despite every effort of the foreman to find or develop it.

Interest shows itself in many ways. A person usually puts more effort into the things he likes better. A feeling of at-home-ness is evident as the employe gets the sense of fitting comfortably into the work he is doing. He may have this contented attitude toward the actual shop operations which make up the usual daily routine. He may be pleased with the shop itself and the equipment provided for the work. He may like especially well the company itself and the supervisory force which directs its activities.

Interest is needed for effective work in any direction. An employe may do good work for a while when he does not like the work, but for steady employment he finds that interest is what keeps him going. Interest brings out his full energy and holds him to the job when conditions are discouraging or when the pressure is extra-heavy.

Interest may be represented as the power itself which furnishes the necessary motive force that enables the operator to keep at the operation continuously, meeting standard requirements. A lack of interest is equivalent to putting on the brakes or dragging a heavy weight. A foreman must recognize the responsibility for keeping this power free to act and for keeping away any dragging weights that might hold back the human machine.

We get interested in things which have become a part of our past agreeable experience. Building up and maintaining this agreeable experience in the shop is a foreman's opportunity. Interest arouses tendencies to act, and the foreman realizes that he must discover what will bring about this interest. As more successes and more satisfactions appear, more active effort may be expected.

Some Kinds of Interests

In the usual factory manufacturing various rubber products are many kinds of interests. Some of these appeal to one type of employe, and some appeal to others. Some interests appeal to nearly all employes. We may describe briefly some of these items which the foreman may have in mind in getting and holding the worker's interest.

Perhaps first of all we should name the shop itself, which should be kept clean and in order, arranged conveniently for the work, and as far as possible kept at an agreeable temperature and adequately ventilated. A good place to work adds to the satisfactions of any job. The

[1] Professor of industrial training, Purdue University, Lafayette, Ind.
[2] India Rubber World, July 1, 1935, pp. 37-40.

foreman should have this influence in mind. Some unpleasant conditions found in shops may be controlled; some may be entirely eliminated.

Closely related to the condition of the shop itself is the care of tools and machines in the shop. Equipment is kept in good adjustment and repair because good tool maintenance is necessary for regular production. But such maintenance is important also for the morale of the workman, who feels that he should be supplied with tools in good condition for the jobs for which they are being used. This point is especially true where there is a system of pay incentive. An operator is entitled to the use of equipment that will enable him to profit from his willingness to work efficiently.

Another necessity for meeting a full production schedule is that of having materials for production arrive on time. This is also important for the satisfaction of the workman, who feels impatient at delays not of his own making. The foreman realizes when the shortage of materials is approaching the danger point, and he takes steps to make sure that the prospective delay does not occur. While such steps are vital to keeping up a steady production schedule, the smooth running of departmental operations is also an interest appeal to the workman.

Any feature of foremanship which helps the workman to earn an expected wage, with the possibility of increasing his pay check, is an incentive for his best, continuous effort. Sometimes the foreman may need to explain how the job can earn more in case there is a willingness to work harder. At other times he may need to explain the wage system and the basis for figuring the wage scale, to overcome a prejudiced attitude against the system. Again during a business depression period he may add a note of encouragement by reminding the workman that other departments or other companies have laid off employes while he still has a steady job.

Advancement Prospects

A foreman wants to help develop the employe's immediate earning power, but he also wants to help an occasional employe to advance to a more responsible position. He realizes that a certain individual has the ability to move up the line in the company's organization. He may call to the man's attention the possibility for a better position ahead, and he may indicate what can be done to prepare for such advancement. He must be careful not to overdo the encouragement and so make the prospect resent the delay or the indefinite postponement of being invited to take a better position.

In any case an individual likes to feel that he has abilities which are recognized by the management. If he has valuable traits, he likes to know that the management believes in him and realizes what he can do. He is pleased to have in mind that some day he may be found to possess just the characteristics needed for a better position. If he feels sure of his own ability, he likes to be understood.

It is also a comfortable situation for one to have confidence that his company is moving in the right direction and that it is likely to get its share of the business when "the times" are better. A foreman can help from time to time to make this possibility evident to his men, if he believes it to be a strong probability.

Developing Men's Ability

Interest in one's work is tied up a good deal with his ability to do his own part of the work successfully. He usually likes to do what he can do well. Any help the foreman can give in improving the ability of his men is a direct help in getting their interest in what they are doing. This requires much more than a "breaking-in" instruction. It demands the recognition of responsibility for always being ready to teach, to explain, to correct, and to be patient as the man is trying to see his mistakes, to overcome his difficulties, and to acquire new skills. Pride in good workmanship is one of the strongest appeals in getting the active interest of men. The best type of workers will always get quite a satisfaction in seeing good finished work pile up in front of them.

For a considerable number of men is a possibility of an added interest which comes with an added understanding of the meaning of the work they are doing. Some men have active minds, and they desire information regarding the products going through their departments. They may wish to inquire as to the nature of the product upon which they are working, or any special characteristic in the design of the finished article, the tools, machines, and special equipment being used, or the handling of unusual materials. Unless trade secrets are involved, the foreman may be glad that the man in the shop wants to be more intelligent in his relation to the company's manufacturing problems.

There is also the possibility of a healthy curiosity regarding the historical and recent developments in the rubber industry. There are new machines, new rubber products, and new lines of competition. There are new conditions involved in the distribution of the product. The foreman must, of course, distinguish between a normal, healthy curiosity and an over-curious desire to gather information that is not needed or that is still in the developmental stage. It seems unfortunate that so few operators have this basic curiosity about the industry of which they are a part.

A foreman has occasions when he may bring to his department new interests, new inventions, or new developments regarding rubber and its applications. Sometimes the idea of novelty breaks the monotony of getting out a standardized product and it adds an element of new life to the department. As such practice is somewhat detached from regular production, it must be used with discretion. For most foremen, however, there is little danger of its being overdone. A photograph, an actual product, samples of materials or processes, or a clipping from a recent magazine or newspaper article may be placed where it can be inspected during the day.

It is possible, then, for a foreman to stimulate a desirable type of curiosity regarding the jobs going through the department, the immediately related problems, and the novel features coming into the rubber business. It is also possible for him to help satisfy this curiosity to an extent.

Fair Treatment of Employes

Very little effective interest may be expected if the men in the department feel that they are not getting a fair treatment. It is not enough merely to treat men fairly. They must realize that the company intends to be just and that it will go out of its way to assure each employe a "square deal." The foreman has the responsibility for seeing that his men understand this fact. It is his first job to clear up misunderstandings before they become exaggerated and before they tend to create bitterness toward the foreman and the company.

The foreman has the job of selling the company to its men. He, surely, has confidence in the management's fairmindedness, and he can best instill this attitude into

the minds of his men. He understands his company's policy regarding many matters affecting his men and he can best interpret such policy in any given case.

As discussed in a previous article,[3] the foreman is charged with building up a good team spirit in his department. This team spirit should also be loyal company spirit. Perhaps his best method of developing this feeling is through having a friendly attitude himself toward his men. His friendliness may well represent the company's friendliness. It is usually understood that way. As a leader rather than a driver, he practices team building all the time. The entire department under his control senses the pleasant relations which he desires. They see courteous treatment on every hand. The agreeable atmosphere adds to each worker's interest in his job.

Company Personnel Features

Another important way of getting and holding the worker's interest is to acquaint him with the company's established attitude toward its employes. The company realizes the desirability of having a spirit of good will or a pleasant relation at all times between the company and its men. Employers today are interested in the welfare of employes. Even apart from the idea that satisfactory employe relations have a business or economic value, most companies have an increasing personal interest in their employes.

While at times in some industries the employes under misguided leadership have attempted to get their demands by "strong arm" methods, most employes have been ready to look fairly at the idea that a company and its men have much in common. They see that both have a desire for steady production, with proper returns for the investor who furnishes the funds as well as for the workman who furnishes the labor. The company tries to make this continuously possible. Sometimes the company gets no returns on its investment, and sometimes the employe is laid off for a time. A foreman sometimes needs to explain that neither can succeed without the other's interested effort.

Various ways of promoting this better relation and stronger interest in the job have been tried out. Some of these may be named. One of the schemes which employes like is that of job insurance providing for a steady job or for a lay-off pay for a specified time, enabling them to plan their expenditures with more assurance of a regular income. Other phases of insurance are provided by different companies with varying amounts contributed by the management and the men. They include: life, retirement, health, and accident features. Some companies provide savings plans, with or without stock ownership provisions. Some provide land, buildings, equipment, or service for recreational activities. Others provide hospital and first-aid facilities, physical examinations, and health advice. Some provide various types of educational program. Many schemes for employe representation in conference with the plant management have been installed. Some of these have tended to build up cordial relations. Others, unfortunately, have taken an antagonistic direction and have not apparently developed the interest of the worker in the company where he is employed.

Summary of Suggestions

Restating the ways suggested for a foreman to get and hold the worker's interest, we may summarize them briefly. These are all stated here from the standpoint of interest and morale, although many of them have other purposes also.

a. Keep the shop itself suitably clean—floors, walls, and windows.
b. See that tools and materials are in order and where they belong.
c. Have equipment and supplies arranged conveniently for regular use.
d. Control the temperature, moisture, and fresh air whenever possible.
e. Make an effort to have the equipment in good repair and adjustment.
f. Do your part in having materials and parts reach your shop on time.
g. Explain to the worker how he may earn more pay if this is possible.
h. Help the worker to understand how the pay check amount is figured.
i. If hours are cut down, overcome worker's feeling of discouragement.
j. Advise the capable and ambitious employe how he may make progress.
k. Recognize ability and other good qualities in workers occasionally.
l. Point out the company's reasonable prospects for future business.
m. Assist workers to approach nearer to their best producing ability.
n. Approve of the worker's taking a pride in his own good workmanship.
o. Encourage an intelligent grasp of the meaning of production orders.
p. Appreciate those who like to keep in touch with new rubber trends.
q. Bring new ideas into the department occasionally for added interest.
r. Treat workers fairly and have them realize this spirit of fairness.
s. Interpret various phases of the company's policies to your workers.
t. Build a good team spirit which should become a loyal company spirit.
u. Show various ways in which the company is interested in its workers.

[3] *Ibid.*, June 1, 1935, pp. 35-36.

Compounding Ingredients

(*Continued from page* 31)

not absorb moisture or volatilize during storage or use. Nontoxic. Practically odorless. Does not discolor rubber and may be used in white stocks. Disperses well in rubber.

RELEVANT MATERIALS. Stearic acid is required for activation of Zenite B. 1% should be used in all types of compounds except in those heavily loaded with reenforcing pigments which require 2% on the rubber.

PURPOSE AND FUNCTION. General purpose accelerator, very safe to handle at processing temperatures. Zenite B stocks age well.

METHODS OF USE. Add directly to rubber.

VULCANIZATION. Has a broad flat curing range and provides active acceleration at curing temperatures of 126° C. (259° F.) and above.

PATENTS. Not disclosed.

Antioxidants

Thermoflex

CHEMICAL COMPOSITION. Di-para-methoxy-diphenylamine.

SELLER. E. I. du Pont de Nemours & Co., Inc.

APPLICATIONS. Tire treads, escalator hand rolls, and all rubber services where very severe flexing occurs.

PHYSICAL STATE. Brown powder.

PROPERTIES. Sp. gr., 1.15. M. p., 103° C. (217.4° F.). Insoluble in water; soluble in benzole, toluol, and hot alcohol. Stability excellent. Non-toxic when used in the amounts recommended. Discolors light colored rubber on exposure to light. Not recommended for white stocks. Does not bloom from cured rubber when used in amounts up to 1.5% on the rubber content. Fluxes readily with rubber at milling temperatures.

PURPOSE AND FUNCTION. It is claimed to be the most outstanding material for prevention of flex cracking. Rates as an excellent antioxidant and has fair heat resisting quality. Imparts no softening or stiffening effect on cured or uncured rubber.

METHODS OF USE. Add directly to the mix, using 1% on the rubber for excellent tread flex cracking resistance.

VULCANIZATION. No effect on rate of cure.

PATENTS. Not disclosed.

Thermoflex A

CHEMICAL COMPOSITION. A mixture of secondary aromatic amines.

SELLER. E. I. du Pont de Nemours & Co., Inc.

APPLICATIONS. For all dark colored stocks to prevent flex cracking.

PHYSICAL STATE. Dark gray powder.

PROPERTIES. Sp. gr., 1.20. Stability excellent. Non-toxic when used in amounts recommended. Discolors light colored rubber on exposure to light and is not recommended for white stocks. Does not bloom when used in amounts up to 1.5% on the rubber.

RELEVANT MATERIALS. Activates acidic accelerators slightly.

PURPOSE AND FUNCTION. Exceptionally good for preventing flex cracking. Superior to Akroflexes and Neozones in that respect. Good antioxidant. Imparts no softening or stiffening effect to cured or uncured rubber.

METHODS OF USE. Add directly to rubber.

VULCANIZATION. No effect on rate of cure.

PATENTS. Not disclosed.

(*To be continued*)

Annals of Rubber[1]

Chronological Record of the Important Events in the History of Rubber

1860. The following named rubber goods manufacturing companies were in operation at the time of the death of Charles Goodyear, which occurred at the Fifth Avenue Hotel, New York, N. Y., July 1, 1860.

Boston Belting Co., Boston, Mass., (1828).
Alfred Hale Rubber Co., Boston, Mass., (1837).
Hodgman Rubber Co., New York, N. Y., (1838).
Mattson Rubber Co., Lodi, N. J., (in the 1840's).
National India Rubber Co., Providence, R. I., (1840).
Bourn Rubber Co., Providence, R. I., (1840).
L. Candee Co., New Haven, Conn., (1842).
Meyer Rubber Co., New Brunswick, N. J., (1843).
Goodyear's Metallic Rubber Shoe Co., Naugatuck, Conn., (1843).
Goodyear India Rubber Glove Co., Naugatuck (1844).
New York Belting & Packing Co., Newtown, Conn., (1846).
Hayward Rubber Co., Colchester, Conn., (1847.)
Bishop Gutta Percha Co., New York, N. Y., (1848).
Union India Rubber Co., New York, N. Y., (1848).
New Brunswick Rubber Co., New Brunswick, N. J., (1849).
Weldon Roberts Rubber Co., Newark, N. J., (early 1850's).
New York Rubber Co., Beacon, N. Y., (1851).
Boston Rubber Shoe Co., Boston, Mass., (1853).
H. P. & E. Day, Seymour, Conn., (1853).
American Hard Rubber Co., College Point, N. Y., (1853).
Gutta Percha & Rubber Mfg. Co., New York, N. Y., (1855).
Tyer Rubber Co., Andover, Mass., (1856).
Davidson Rubber Co., Boston, Mass., (1857).
New Jersey Car Spring & Rubber Co., Jersey City, N. J., (1858).
Lambertville Rubber Co., Lambertville, N. J., (1860).

1861. Solid cab tires were introduced in London.

1862. John Murphy, superintendent of the Gutta Percha & Rubber Mfg. Co., Brooklyn, N. Y., defibered vulcanized rubber scrap by boiling it in a solution of sulphuric acid.

J. Leighton introduced rubber hand stamps as a marking device.

1863. Humphrey in British patent 3,183 replaced the carbon disulphide of Parke's cold vulcanization process with petroleum spirit.

1864. First carbon black produced and sold commercially in the United States was made by J. K. Wright, an ink maker of Philadelphia, Pa., for use in making printing ink. He made the black on sheet-iron cylinders revolved over gas jets from which the black was removed by stationary scrapers.

J. Spiller began the earliest recorded work on the oxidation of rubber.

1865. Ivory-like material was made from chlorinated rubber.

1866. Foster introduced mercuric sulphide as a rubber vulcanizing pigment.

Henry George Tyer began the manufacture of druggists' rubber goods in Andover, Mass.

1867. Austin Goodyear Day, cousin and employe of Charles Goodyear, brought the primary invention of vulcanization to a high state of utility, cheapened the manufactured product so as to bring it within the reach of the masses, and invented Kerite, a compound with such insulating qualities as to lead to its almost universal use. The continuous demand for rubber had grown to such an extent that fine Para doubled in cost, reaching an ordinary price of $1 a pound. Other sorts were selling at 12 and 15¢ and were dear at those prices. The great question then was what would the world do for rubber. Day met this situation by the invention of a method for cleaning the inferior sorts. The demand for the inferior grades quickened and eventually reached a price that interfered with profits, particularly as Para in its turn came down to a reasonable figure. At this point the cleaning process was disposed of, and Day took up insulation in the electrical field, resulting in the perfection of Kerite.

1868. Charles Goodyear's patent for the vulcanization of rubber by heat and sulphur was finally held valid by the United States Supreme Court after eight years of litigation.

1869. Vulcanization of rubber with halogens was started.

1870. The original Akron rubber factory was founded by Dr. Benjamin Franklin Goodrich. He was induced by Akron business men to move to Akron from Hastings-on-Hudson, N. Y., a rubber factory he had acquired following the Civil War as a result of several real estate transactions.

The use of factice, otherwise known as rubber substitute, became common in France as a rubber compounding ingredient. Anderson in 1847 first realized the industrial possibilities of these sulphur-oil compounds.

Davol Rubber Co., Providence, R. I., was established by Joseph Davol for the manufacture of druggists' sundries. It is the largest in the world devoted exclusively to that line.

1871. Golf balls with rubber center and gutta percha covers were made by Captain Stewart.

E. H. Clapp Rubber Co., Boston, Mass., established by E. H. Clapp, manufactured reclaimed rubber (1871-1934).

M. Stévart, at the School of Mines, Liège, Belgium, demonstrated experimentally that rubber is incompressible to the same extent as fluids.

1872. A combination of rubber, pitch, ashes, and granite was used by F. S. Thomas for making roads, floors, etc.

The Goodyear Rubber Co., Middletown, Conn., was established by F. M. Shepard and J. A. Minott to manufacture rubber shoes.

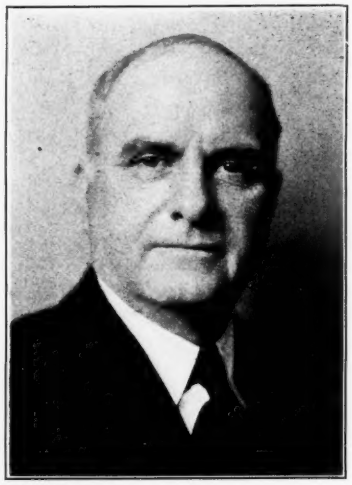
John Howarth received a patent for the manufacture of carbon black from natural carbureted gas.

Kerite Insulated Wire & Cable Co., New York, N. Y., was established by Austin Goodyear Day.

(To be continued)

[1] Continued from India Rubber World, July 1, 1935, pp. 30, 44.

Publisher's Announcement



Blank-Stoller, Inc.

Wm. M. Morse

Wm. M. Morse Becomes Editor Emeritus

AFTER more than twenty years of active participation in the editorial department of this publication Mr. Morse retired, July 8, from active duty and became Editor Emeritus.

During the past seventeen years he held the post of Editor and in that capacity maintained the splendid editorial standards established by the founder, Henry C. Pearson.

As Editor Emeritus, Mr. Morse will maintain close contact with the INDIA RUBBER WORLD staff in an advisory capacity.

The entire staff of the magazine joins with me in wishing Mr. Morse many years of continued good health and the fullest enjoyment of his increased leisure directed to the pursuit of those outdoor activities in which he has always been so keenly interested.

© Bachrach

D. C. McRoberts

D. C. McRoberts Advanced to Post of Editor

ON JULY 8, D. C. McRoberts assumed the post of Editor of INDIA RUBBER WORLD. With more than twenty-two years of continuous activity in both the technical and manufacturing phases of various branches of the rubber business Mr. McRoberts is widely acquainted in the industry.

After majoring in sciences at Wabash College, he entered the rubber industry, in 1912, as chief chemist of the G & J Tire Co., Indianapolis, Ind. Since then, and until his association with this publication as assistant editor about one year ago, Mr. McRoberts was connected with various important rubber and reclaiming plants with technical or manufacturing managerial responsibilities. He therefore has a thorough understanding of the current problems of the rubber industry.

Richard Seymour Bell

PUBLISHER

EDITORIALS

Progress Pays for Itself

THE recent extension of the National Housing Act to April 1, 1936, contained revisions of importance to the rubber industry. In the original act credit for the modernization of commercial buildings and industrial plants was limited to the same amount: namely, $2,000, as was accorded to the private home owner.

A credit of such size was of little interest or value to the sound industrialist; consequently applications from this source were unimportant.

The revision now in effect raises the limit of credit for each individual plant to $50,000, an amount sufficiently large to permit undertaking the long-neglected plant and equipment rehabilitation projects that will result in reduction of waste, increased production effectiveness, and generally improved products—a combination of progressive conditions that are fundamentally important in bridging the gap from little or no profit to a satisfactory and justifiable return.

During the past five years many rubber plants have pigeon-holed project after project that would return the original outlay in but a few months because of the difficulty or impossibility of obtaining the necessary funds. The National Housing Act, as it now stands, removes for a limited time this barrier to industrial progress and with terms so favorable as not to interfere with operating capital.

The New York office of the Federal Housing Administration states that these loans are applicable to practically all types of rubber working machinery and equipment; therefore action toward modernization rests with the plants themselves.

The publishers of India Rubber World have made an extensive study of the whole subject of industrial loans, such as those now made available via F.H.A. The knowledge they have gained will gladly be made available, and without obligation, to interested members of the rubber industry.

Wild Rubber—Plantation Rubber—Latex

WHEN considering the two major eras of crude rubber use, first wild rubber, then plantation grades, and now witnessing a rapid expansion of the use of latex, one is inclined to speculate as to whether or not the rubber industry is entering a third era which will see latex displacing plantation grades as the latter was substituted for wild rubbers some years ago.

Peaceful Labor Relations?

UPON signing the Wagner Labor Relations Bill thus making of it a Federal law, President Roosevelt issued a statement which said among other things:

"This act defines, as a part of our substantive law, the right of self-organization of employes in industry for the purpose of collective bargaining, and provides methods by which the government can safeguard that legal right. . . .

"Accepted by management, labor and the public with a sense of sober responsibility and of willing cooperation, however, it should serve as an important step toward the achievement of just and peaceful labor relations in industry."

We are compelled to wonder if the President read the bill. It hardly seems reasonable that management could be expected to accept voluntarily a regulation that subtly and to a great extent erroneously accuses it of coercing, exploiting, and interfering with the rightful interests of employes; one that has the alleged object of guaranteeing employes the right of bargaining collectively, but at the same time limits the kind by rendering illegal great numbers of equitably planned, peacefully established, and smoothly operating employe representation schemes, the by-laws of which usually give workers more liberal benefits, including arbitration privileges, than are accorded by irresponsible unions, and that, without employes defraying the expense of organization or of membership dues; and that empowers a Labor Board, appointed by the President, to serve charges against the employers, hear evidence, and render decisions under a lack of rules that permits the free exercise of their own or administration desires.

Commentators liken the biased regulations of this Act to that of NRA, which provoked litigation that finally resulted in the Supreme Court annulling it for unconstitutionality. The Wagner Act seems destined to precipitate discord and litigation leading to the Supreme Court before, if ever, it brings about the "peaceful labor relations" that President Roosevelt so optimistically expects.

Is it not logical to assume that administration support of influences not consistent with employer-employe mutuality of interest will cause chaos, not peace?

D C McRoberts

EDITOR

What the Rubber Chemists Are Doing

Choice of an Accelerator for Cable Insulation[1]

D. McQuarrie[2]

THE study of rubber mixings used in the early days of the cable industry reveals the use of magnesia and litharge as accelerators of vulcanization. Magnesia was always present; while litharge was confined to drab rubbers. Magnesia, then, possessed the advantage over litharge as an accelerator that it was available for use in both white and drab rubbers. Unfortunately even small quantities of magnesia impaired the electrical properties of the dielectric containing it.

The improvement shown by cable rubbers since the advent of organic accelerators has sufficiently proved the remarkable properties possessed by these substances, and the cable manufacturer cannot exclude them from his rubbers if he wishes to meet the stringent specifications laid before him.

It is stated that the first organic accelerator used on a commercial scale in cable rubbers was piperidine, in 1912. A case was brought to light some years ago concerning the satisfactory results obtained by using *p*-nitrosodimethylaniline in insulated wire, which showed this accelerator was at least one of the first to be used in the cable industry.

The choosing of an organic accelerator to impart to cable rubber improved physical, chemical, and electrical properties which will be maintained over a lengthy period of service is a big step towards supplying the wants of the consumer.

As the presence of an accelerator appears to bring about a more complete combination between rubber and sulphur, the amount of sulphur added to the mixing can be reduced. This feature is very desirable from the aging standpoint and also does much to prevent trouble due to failure in service. If the coating of tin protecting the copper wire breaks down, two damaging influences come into force. The rubber dielectric, coming into direct contact with the copper, deteriorates to the detriment of the electrical properties, and the free sulphur may produce brittleness in the copper wire, resulting in a break and, consequently, a failure of the cable.

Accelerator Characteristics

The common practice of comparing two different classes of accelerators on the base of price per pound is a very unfair one. For example, since half the amount of mercaptobenzothiazole to diphenylguanidine gives about the same accelerating effect in a mix, and as the price of the former is only about one and three quarter times that of the latter, mercaptobenzothiazole shows a lower cost per active unit.

It is most essential that the accelerator be free from any poisonous and obnoxious properties.

The color possessed by an accelerator is not always a criterion regarding its ability to discolor a white stock. For instance, mercaptobenzothiazole is light brown, yet can be used in white rubbers without discoloration. In complete contrast to this, diphenylguanidine, a pure white powder, imparts an ivory tinge to its white vulcanizates.

The tendency for an accelerator to volatilize from the unvulcanized stock during storage or processing is very undesirable and results in a non-uniform vulcanized product. In the same way, if blooming of the accelerator occurs in the unvulcanized stock, similar results are obtained, and any care which may have been expended to obtain a homogeneous mixture of the accelerator and rubber will have been futile. A stable accelerator, therefore, is an important choice when one considers the effect of vulcanization on the electrical properties.

Almost all chemical compounds soluble in water tend to lower the dielectric strength of rubber insulations containing them, and it is for this reason that insoluble accelerators are recommended. One serious objection to water-soluble accelerators is the variation in cure experienced when used in open steam vulcanization, but, as cables which are to be cured in open steam are usually wrapped with rubber-proofed tape, the tendency of the water-soluble accelerator to be leached out by the steam is minimized considerably.

Aging

Certain accelerators definitely possess an antioxidant character which is very desirable as the electrical properties of a cable are affected when the dielectric undergoes decomposition. It is found that within limits the lower the sulphur content, the better the aging properties of the vulcanized product. Tetramethylthiuramdisulphide provides a striking example of the advantage to be obtained by low sulphur compounding. When used as a vulcanizing agent to the extent of 3 to 5% on the rubber content, it produces vulcanizates with exceptionally good aging properties. The amount of sulphur liberated is very low, just sufficient for vulcanization to proceed. If, however, it is present as an accelerator the ratio of sulphur to accelerator has a marked effect on the aging of the vulcanized rubber, the quality of which decreases as the amount of sulphur to accelerator increases. Care should be taken in adjusting the ratio of sulphur to accelerator in order to obtain vulcanizates showing the least possible tendency to stiffen during the life of the cable.

Plateau Effect

A desirable feature of accelerators for cable insulation, as for other purposes, is a marked plateau effect. This is important in the case of cables requiring a talc cure where, because of the bulk of cable and talc, the danger of uneven curing is always present. A stock containing an accelerator which possesses this valuable property is not sensitive to overcure. Uniform cures are more easily obtained, and errors in the curing operation are minimized. Although the timing and temperature of a cure may have had the most careful attention, it must be kept in mind that the unloading of a vulcanizing pan containing possibly over a thousand yards of cable takes time, and the cable rubber will continue to vulcanize until the heat drops below the active curing temperature of the accelerator.

Cables cured in talc are specially susceptible to this problem as the talc cools very slowly; therefore the last pan to receive attention has held its heat for a considerable period after the first. In view of these conditions the most suit-

[1]Abstracted from *Trans. Inst. Rubber Ind.*, Dec., 1934, pp. 320-24. Paper read at a meeting of the Scottish Section of the Institution of the Rubber Industry, October 24, 1934, at the Institution of Engineers and Shipbuilders', Glasgow, Scotland.

[2]Craigpark Electric Cable Co., Ltd.

able types of accelerators for talc cured cables are those usually designated as medium speed and delayed action types.

The plateau effect permits longer cures for very thick dielectrics without the risk of overcure to the outside. It is recommended, however, that extensive aging tests on such accelerated stocks be performed as it does not follow that because an accelerator shows small variations in tensile strength over a prolonged period of cure that all vulcanizates cured over that flat period will show good resistance to aging.

Delayed Action

Some accelerators, after reaching vulcanizing temperature, do not promote vulcanization immediately, but exhibit a distinct pause, after which their full accelerating effect is attained. Such an accelerator is said to have a delayed action, and its inclusion in cable rubbers helps toward solving the problem of heat penetration when vulcanizing large quantities. A cable rubber, however, does not require an accelerator to show a too-pronounced delayed action because a fairly quick set-up is essential to hold the shape of the dielectric and also to prevent decentralization of the conductor.

It is essential to choose an accelerator having a critical temperature above the processing temperature required to mill, calender, and extrude the stock where a high temperature must be maintained a long time. It is also essential that this tendency to prevulcanize be absent when uncured scrap is being reworked, as the scrap obtained from the longitudinal process of covering conductors with rubber insulation may amount to as much as 40%.

Summary

In the assessment of an accelerator the final criterion should be factory processing. In small-scale experimental work it is possible to handle even ultra-accelerators with ease as the small quantities of rubber stock can be quickly cooled and prevented from overheating. In the factory conditions are different.

The choice of accelerators, apart from their effect on electrical characteristics, is limited today to those types classified as medium, delayed action, and semi-ultra, according to their speeds, but there appears to be a future for ultra-accelerators with a sufficiently delayed action to allow of even vulcanization of large quantities of insulated wire.

MANUFACTURING ADHESIVE TAPES. *Gummi-Ztg.*, May 31, 1935, pp. 547-48.

PROBLEM OF THE ANALYTICAL EVALUATION OF RUBBER RECLAIMS. F. Kirchhof, *Kautschuk*, June, 1935, pp. 115-18.

ANTIOXIDANTS. I. Test in a Rubber-Sulphur Mixing. J. R. Scott, *J. Res. Assocn. Brit. Rubber Manufrs.*, 2, 117-28 (1933).

Rubber Bibliography

CHEMICAL CONSTITUTION OF RUBBER IN THE LIGHT OF STAUDINGER'S WORK. I. Allen, Jr., and E. R. Sauter, *J. Chem. Education*, 12, 135-38 (1935).

P-NITROPHENOL IN CREPE RUBBER MANUFACTURE. T. E. H. O'Brien; [First Quarterly Circular (1934)], *Rubber Res. Scheme*, Ceylon, 11, 1-2 (1934).

ENRICHMENT OF VOLATILE COLORING MATTERS FROM RUBBERWARE IN PAPER AND WOOD. H. Härdtl, *Chem. Ztg.*, 59, 327 (1935).

MANUFACTURE IN ITALY OF VULCANIZATION ACCELERATORS AND ANTIOXIDANTS FOR RUBBER. A. Beretta, *Chimica e l' Ind.*, 17, 163-71 (1935).

COMBINED USE OF TWO DIFFERENT VULCANIZING ACCELERATORS. V. Mercaptobenzthiazole and Hexamethylenetetramine. I. Aoe and H. Kitayama, *J. Soc. Rubber Ind. (Japan)*, 7, 482-503 (1934).

OXIDATION OF RUBBER BY HYDROGEN PEROXIDE. B. Kagan and N. Sukhareva, *J. Rubber Ind. (U.S.S.R.)*, 11, 46-53 (1934).

CHLORINATION OF DISAGGREGATED RUBBER. B. V. Buizov, V. S. Molodenski, and N. I. Mikhailov, *J. Rubber Ind. (U.S.S.R.)* 11, 44-46 (1934).

INFLUENCE OF FILLERS ON VULCANIZED RUBBER. D. J. Van Wijk, *Verfkronick*, 8. 95 (1935).

INFLUENCE OF PIGMENTS IN PAINTS AND LACQUERS IN COMPARISON WITH THAT IN RUBBER. H. W. Talen, *Verfkronick*, 8, 92-94 (1935).

COMPRESSION TESTS ON PLASTICITY OF UNVULCANIZED RUBBER. A. Speedy, *India Rubber J.*, 89, 342 (1935).

PLACE OF RUBBER IN MOTOR CAR UPHOLSTERY. W. H. Chapman, *Trans. Inst. Rubber Ind.*, Apr., 1935, pp. 429-45.

FATTY ACID SOFTENERS IN RUBBER COMPOUNDING. C. M. Blow and T. L. Garner, *Trans. Inst. Rubber Ind.*, Apr., 1935, pp. 446-72.

SOME TECHNICAL CONTROL METHODS USED IN PROOFING. R. A. Hodgson, *Trans. Inst. Rubber Ind.*, Apr., 1935, pp. 473-80.

THEORY AND APPLICATION OF THE PARALLEL-PLATE PLASTIMETER. Part 2. J. R. Scott, *Trans. Inst. Rubber Ind.*, Apr., 1935, pp. 481-93.

SEMI-EBONITE. Part I. P. A. Gibbons, *Trans. Inst. Rubber Ind.*, Apr., 1935, pp. 494-516.

SYNTHESIS FROM UNSATURATED HYDROCARBONS. J. A. Nieuwland, *Ind. Eng. Chem.*, July, 1935, pp. 850-54.

COLORING CAOUTCHOUC IN BULK. R. Boxler, *Gelatine, Leim. Klebstoff*, 2, 184-86 (1934); *Chem. Zentr.*, ii, 2755 (1934).

ELASTICITY OF CAOUTCHOUC. K. H. Meyer and C. Ferri, *Helv. Chim. Acta*, 18, 570-89 (1935).

RUBBER AS RAW MATERIAL. F. Evers, *Kautschuk*, June, 1935, pp. 118-20.

MODERN INSTRUMENTS FOR DETERMINING HYDROGEN-ION CONCENTRATION. II. A. Karsten, *Kautschuk*, June, 1935, pp. 120-23.

FIRE RESISTANCE OF RUBBER. Rubber Carpets for Steamers. F. Jacobs, *Caoutchouc & gutta-percha*, June 15, 1935, pp. 17177-80. (Conclusion.)

DIFFERENT RUBBER RECLAIMING PROCESSES. G. Panouilleres, *Caoutchouc & gutta-percha*, June 15, 1935, pp. 17182-84.

METHOD OF ANALYSIS PROPOSED IN TESTS OF VULCANIZED RUBBER ESPECIALLY OF RUBBERS USED IN THE ELECTRICAL INDUSTRY. A. R. Matthis, *Rev. gén. caoutchouc*, May, 1935, pp. 3-9. (Conclusion.)

RUBBERIZING FABRICS ON THE CALENDER. A. Trepau, *Rev. gén. caoutchouc*, May, 1935, pp. 10-14.

EFFECT OF INGREDIENTS ON THE SCORCHING OF MIXINGS WITH DIFFERENT ORGANIC ACCELERATORS. Translated from an article by B. Fabriziew and I. Skouba, *Rev. gén. caoutchouc*, May, 1935, pp. 15-23. (Conclusion.)

ACCELERATORS WITH RETARDED ACTION. F. Jacobs, *Rev. gén. caoutchouc*, May, 1935, pp. 25-31. (To be continued.)

ACCELERATORS DERIVED FROM PIPERIDINE. F. Jacobs, *Rev. gén. caoutchouc*, May, 1935, pp. 32-36.

RUBBER IN LUBRICANTS. H. P. and W. H. Stevens and M. B. Donald, *Bull. Rubber Growers' Assocn.*, May, 1935, pp. 213-16.

INCORPORATION OF RUBBER IN TAR PRODUCTS. D. D. Pratt and R. Handley, *Bull. Rubber Growers' Assocn.*, June, 1935, pp. 245-55.

FUTURE PROBLEMS IN RUBBER. E. A. Hauser, *Rubber Age (London)*, July, 1935, pp. 138-39.

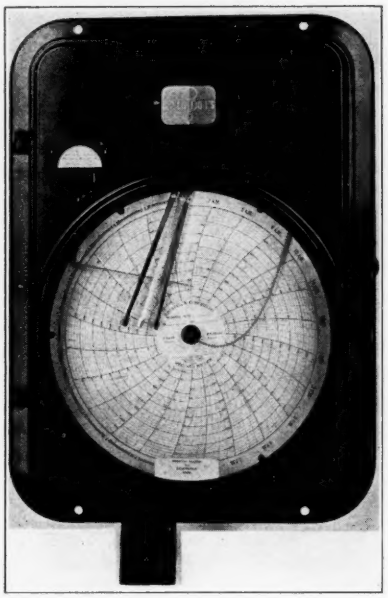
MEASUREMENT OF ABNORMAL VISCOSITIES BY FALLING SPHERE. F. Hirata and K. Rubo, *Rubber Age (London)*, July, 1935, p. 150. Translation.

RECLAIMING AND RECLAIMS. A. Calver, *India Rubber J.*, July 6, 1935, pp. 19-20, 22.

New Para-Dors

A series of five new Para-Dors has been developed as deodorants for rubber compounds to make more complete the type and price range of products suitable for rubber deodorization. The new series includes a Para-Dor for offsetting the odor of smoked sheets without introducing a prominent new odor to the cured compound. These products will greatly facilitate the selection of an odor appropriate for particular types of compounds and to conform to cost limitations.

New Machines and Appliances



Bristol Flow Meter

Flow Meter

THIS meter employing the widely accepted orifice and mercury manometer system of flow measurement is claimed to meet the needs of industry for a rugged, accurate, and reasonably priced mechanical flow meter. In the rubber industry such a meter is indispensable when it is desired to measure the departmental distribution of steam from the boiler plant in order to determine correctly distribution of cost charges. The design and construction of the meter conforms to the high standards of its manufacturer.

Meters are available as indicators, integrators, recorders, or controllers. Recorders can be furnished with pressure and temperature elements. Integrating flow meters are obtainable either with or without automatic compensation for fluctuations in static line pressure. Meters are suitable for use with either orifice plates or venturi tubes. With Bristol's Metameter, this new flow meter can be supplied as an electric flow meter for remote reading. The Bristol Co., Waterbury, Conn.

Bottle Hood Applicator

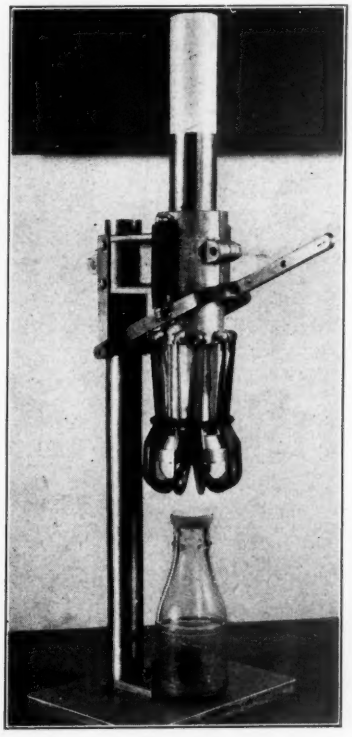
A "COVER-ALL" hood of 0.015-gage sheet rubber resistant to butter fat and odorless has been devised for application to the tops of milk bottles over the paper disk closure or alone.

Once applied, this hood cannot be removed without destroying it, thus making it tamper-proof. The machine illustrated is designed for applying the hoods. These, packed as flat disks in a paper tube, are mounted on the tubular magazine of the machine through which they descend by gravity to the fingerlike expanding device which stretches and places them over the bottle top by the downward movement of the hand operated lever. These machines are also designed to operate automatically at any desired speed in conjunction with all types of filling equipment utilized by the larger dairies.

A simple printing machine with multigraph attachment is available to print special brands automatically at the rate of 3,000 hoods per hour. John R. Gammeter.

Electrical Control for Platen Mold Presses

CLOSE control of platen temperature on rubber presses using electricity as a heating medium can be effected by means of the Rotax controller, pictured, applied on the platen strip heaters. This controller is equipped with a relay that can handle as many as six 100-watt heaters without difficulty. It can also be fixed to keep any number of the heaters on while the rest alternate on and off. The rotating type of contacts used permit the arrangement of either two heats and an off position or three heats and an off position. The controller is completely enclosed in a neat rectangular case similar to the one illustrated except the usual range for platen mold presses is 150 to 300° F. Foxboro Co.



Machine to Apply Milk Bottle Hoods

Electric Temperature Controller

Calender Shells

THE 3-S calender shell is spider built and machined on a square bar, insuring true alinement the entire length. The spiders are made of 4 pressed steel angles spot welded and drawn to place 0.015-inch oversize. They will twist a 1¼-inch bar without the shell head or rivets. Cold-drawn special seamless 16-gage steel tube is used for the exterior of the shell. The heads are drop forged. These shells are built in 19 size lengths running from 12 to 65 inches in extreme length for square bar sizes of 1¼, 1½, and 2 inches. The National Sherardizing & Machine Co., Hartford, Conn.

Pocket Slide Rule

THE illustration represents a small, lightweight, and accurate slide rule convenient for carrying in the vest pocket. The material of which it is constructed is indestructible, waterproof, and not affected by grease; therefore it can be kept clean easily.

The front side of the rule has four scales, Log, C, D, and C inverted scale. The reverse side has sine and tangent

scales and an A and D scale for finding squares and square roots. The scales are on a disk 2¾ inches in diameter, length of multiplication-division scale 6.3 inches as against five inches on "A" scale of the regular 10-inch slide rule. Tests have proven that the average accuracy of the Mascot slide rule in making rapid slide rule calculations is within ¼ of 1%. This is somewhat better than the accuracy obtainable on the upper or "A" scale of the popular 10-inch "slip-stick." Tavella Sales Co.

Portable Pyrometer

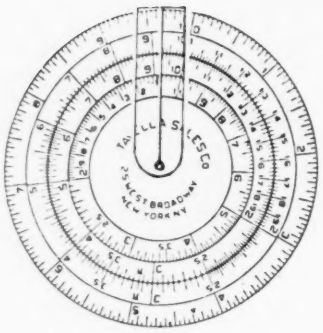
THE portable hand pyrometer of the lance type shown in the illustration is of the low-resistance type, thereby combining high accuracy with rugged construction.

This portable hand instrument serves for checking temperatures in all the applications where a wall-type pyrometer is used. For general use it has the additional advantage of portability. It is recommended as an exploring instrument to gather heat data in chemical and industrial processes, as a "trouble shooter" and as a check tester in existing pyrometer installations. The Russell Electric Co.

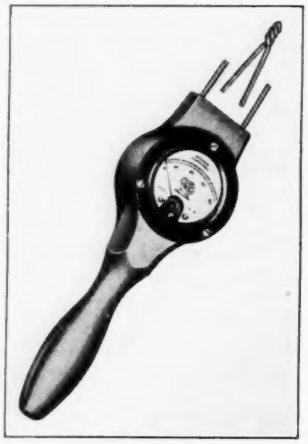
Unique Reduction Units

THE 5 reduction units pictured are part of a shipment of 14 units supplied to one of the largest chemical companies in this country. They are unique because, in spite of their size, they are only 5 h.p. units. They are driven by 1,800 r.p.m. motors and have an output speed of 1 r.p.m. on the output shaft, representing an 1,800 to 1 reduction. For transmission of 5 h.p. the output shaft is 5 inches in diameter. The unit was supplied for driving agitators in liquid mixing tanks, and the entire suspended load and the thrust of the agitator totaling approximately 5,000 pounds is carried on a tapered roller bearing inside the reducer unit.

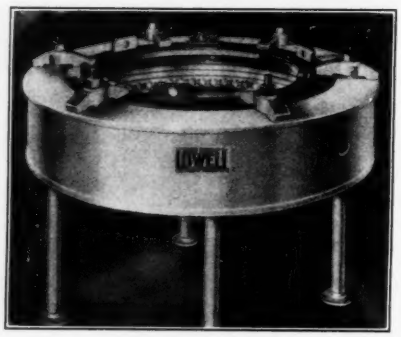
These units employ the gearless reduction principle, operate at a comparatively high efficiency with little noise and no vibration, and are equipped with oilless guide bearings in the base to prevent shaft vibration or distortion and to protect the reducer bearings above. The Patterson Foundry & Machine Co.



Mascot Pocket Slide Rule



Russell Pyrometer Lance



Lowell Full-Circle Retreader

Full-Circle Retreader

THE full-circle tire retreader illustrated comprises an annular casing insulated on its exterior with asbestos and having within two circumferential cavities, one for circulation of steam and the other for reception of a tire tread mold made up in two sections of aluminum. The tire to which the raw tread stock has been cemented is adjusted in the mold cavity and backed by an airbag of segment cross-section.

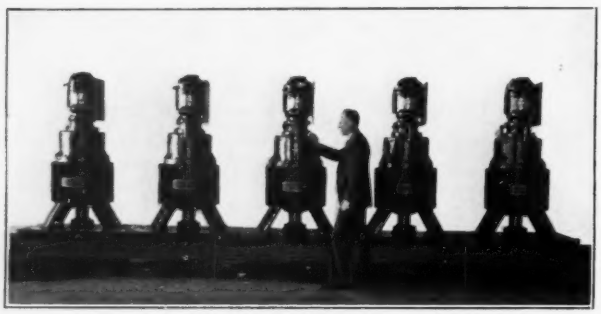
Molding pressure in the airbag is applied by a folding pressure band or ring set firmly against the airbag by a pull on a hand lever. Uniform pressure and free steam circulation insure perfectly cured, full-circle retreading of tires. Lowell Equipment Co.

Latex Dipping of Fabrics [1]

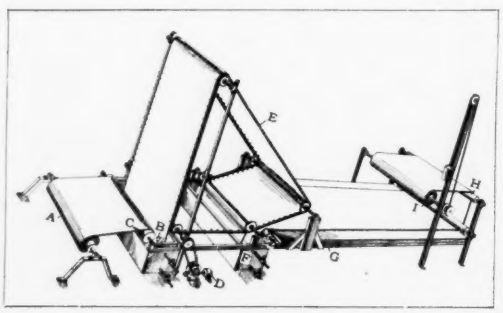
AN APPARATUS for dip-coating fabrics with latex rubber is so arranged that the material applied is of uniform texture and entirely free from streaks and other blemishes incidental to slow coagulation of the latex. The arrangement of the apparatus comprises spaced standards for supporting a roll of fabric *A* on a shaft from which it is unrolled and drawn into a bath of latex contained in a tank *B*, jacketed for circulating a cooling medium for maintaining the latex liquid at about 40° F. to prevent its deterioration and the formation of scum on its surface.

The fabric is guided into the tank over a roller *C* and out of it by a similar roller located in the bottom of tank *B*. A motor *D*, connected to chain conveyer *E*, serves to draw the fabric through the latex bath at the proper speed so that the coating will coagulate without running, also to retain the fabric in stretched condition while it is passed through the drying and curing zone. The air surrounding the apparatus is maintained at about 90° F. The latex begins to coagulate as soon as the coated fabric contacts with the warm air. Coagulation continues until the fabric passes into the water tank *F*, where the fabric is automatically removed from the conveyer in its passage through this wash tank. It proceeds thence along the drying and dusting table *G* to the tension wind-up *H*, where it is rolled up on shell *I* in finished condition.

[1] U. S. patent No. 1,995,767, Mar. 26, 1935.



Patterson Reduction Units



Rubber Industry in America

OHIO

WHILE rubber manufacturers have benefited from the high level of automobile production, conditions in this industry contrast rather sharply with those in the automotive field. New equipment sales have recorded sharp gains, but total sales have been relatively low owing to the trend of replacement sales. For the first quarter domestic shipments of tires were only 5% larger than in 1934, despite the 47% increase in automobile production. The quarterly survey of April 1 revealed that stocks of tires in the hands of distributers were less than a year ago; stocks in the hands of manufacturers, however, are relatively high and in excess of last year's total. Some improvement has been reported in the retail price structure, but conditions are still unsettled.

Strike conditions in the rubber industry are adversely affecting business. Threats of new walk-outs are constantly appearing.

One tire manufacturer reports his business 100% ahead of that for the same period last year and attributes this gain to the end of the NRA. Another smaller company is operating at 25% of capacity. The consensus of opinion seems to be that the present attitude in Washington is retarding business, for no one seems to know what next to expect.

A sundries manufacturer reports trade conditions satisfactory as to volume, with shipments for the fiscal year ended June 30 greater than during the previous period. The discontinuance of the NRA has not affected business, and the firm is continuing under the conditions of the late code. The most disturbing factor in rubber is price demoralization, and there seems to be no hope in the immediate future for correcting this uneconomic condition so that conditions in the industry may improve.

Chemical prices, by and large, are holding firm regardless of the smaller demand in the rubber trade. Carbon black stocks on hand seem the smallest since 1929.

The Bridgwater Machine Co., Akron, according to B. E. Bridgwater, has increased the floor space in its tire mold engraving and finishing department and has added machinery to handle increased business in tire molds. The office space has also been enlarged. Mr. Bridgwater further stated that the firm's business the first half of this year has been very satisfactory, having exceeded any similar period since 1929.

Goodrich Activities

The B. F. Goodrich Co., Akron, reports that a truck in its Silver Fleet devoted to testing automobile tires turned up 500,000 miles on its speedometer in June. It is continuing to pile up mileage in the Silver Fleet. Placed in service in September, 1931, the truck has averaged 11,100 miles monthly, has been driven in eighteen states, mostly Ohio, Florida, and California. It has burned 83,328 gallons of gasoline, or more than ten tank carloads. The truck has the original motor block, transmission and rear end; while replacements have been made of rings, brakes, connecting rod bearings, etc. Three drivers, Oliver H. Walsh, with twelve years' service in the Silver Fleet, Allen B. Clayton, test car driver for six years, and Bryce Kelley, driver for six years, have piloted the truck over its entire mileage, working in three shifts of eight hours each.

Few cars in the Silver Fleet are ever retired from fleet service or turned in for new models, with less than 200,000 miles on their speedometers. Frequently they attain records of 350,000 miles before they are traded.

More than a million people have already viewed the talking film "Highway Patrol" now being shown throughout the country by Goodrich dealers. The film stresses, among other things, safety on the highway and has an interesting plot revolving about the duties of highway patrolmen.

Over a thousand employes on the Akron factory and office payrolls of the Goodrich organization have twenty years or longer of service. The oldest employe in point of service has been with the company nearly 47 years.

The national account sales department of the Goodrich company has been placed under the direction of G. E. Brunner with the title of manager, factory account sales, according to Vice President S. B. Robertson. Mr. Brunner, since 1930, has been in charge of special account sales, which he will continue to handle in the new department. W. W. Gill, in charge of national account sales, will remain as manager of that department, reporting directly to Mr. Brunner. Joining the Goodrich organization in 1929, when the Miller Rubber Co. was united with Goodrich, Mr. Brunner became sales manager of the Miller tire division.

J. A. Hoban, manager of retail sales, has announced the following appointments at indicated Goodrich Silvertown stores. Managers: Owensboro, M. J. Crafton; York, C. E. Sears; Credit and Operating Managers: Ada, W. R. Stewart; Asheville, S. V. Davenport; Clarksburg, H. R. Collins; Miami, C. F. Marsh; Pensacola, J. G. Burkett; Riverside, B. W. Linton.

Goodrich also is opening the following new units in its Silvertown stores: 1043 Broadway, Albany, J. T. Dinwiddie manager, also headquarters of the Albany district, F. G. Harrison, Jr., district manager; Broad and Seventh Sts., Gadsden, with E. D. Halloway manager; Milam and Polk Sts., Houston, G. L. Duncan manager, to discontinue store at Polk and Caroline Sts.; 634-38 Cass St., Joliet, J. W. Lambur manager, J. F. Cafferty credit and operating manager; 13th St. and Grand Ave., Kansas City, K. A. Short manager; 624 S. Front St., Mankato, T. B. Gauper manager, W. E. Lamb credit and operating manager; 146 S. Main St., Marion, G. H. Alber manager; 1401 W. Mitchell St., Milwaukee, M. L. O'Brien manager; St. Louis and Conception Sts., Mobile, W. H. Lord manager, to discontinue store at Government and Bayou Sts.; 211 N. Cedar St., Owatonna, R. T. Hellie manager, A. H. Orwoll credit and operating manager; Franklin St. and Madison Ave., Peoria; Fifth and Jackson Sts., Sioux City, H. J. Kipper manager, to discontinue store at 619 Pearl St.

Roger Firestone, fifth son of Harvey S. Firestone, Sr., chairman of the board, Firestone Tire & Rubber Co., Akron, having been graduated from Princeton University, will join his father's company, where his four brothers already are employed. During his vacations the youngest Firestone used to work in the organization's research laboratories.

The General Tire & Rubber Co., Akron, recently held its annual picnic sponsored by the Ten-Year Service Club at Myers Lake Park, Canton, which was attended by nearly seven thousand, including employes, their families, and friends. Rudolf H. Ulrich, with the Development Department of the Firestone Tire & Rubber Co., Akron, since 1927, resigned to join the staff of the General company. Prior to his Firestone connection, Mr. Ulrich had been with the Research and Development Department of the Continental Tire & Rubber Co., Hannover, Germany.

(*Continued on page* 50)

NEW ENGLAND

BUSINESS in New England is holding up well for this time of the year. While recessions were expected, the comparatively low inventories in most lines have a stabilizing influence. The Supreme Court decision on the NRA has had little, if any, effect upon business activity. Machine tool orders are at the highest level in five years. This heavy volume of business is stimulated by the need of lower unit costs.

Shoe manufacturers are somewhat more active, and new orders for fall goods are ever increasing, to be ahead of last season. Footwear prices are expected to rise. Better quality merchandise is being purchased even though the low qualities of rubber footwear are still being offered. Reports indicate spring and summer business in units of dollars was less than in 1934, chiefly owing to the unusual amount of rain.

Tire manufacturers, while experiencing good business, are still at a disadvantage because of the price war. Volume of business is greater than for 1934, but profits are the same or even less.

Sales of cotton goods are below current production, however, and some price concessions have been made, with the bulk of business for immediate delivery. Although inventories are not burdensome, most mills, running at little or no profit, scheduled a sharp curtailment in operations the beginning of July, as unfilled orders were declining.

Boston continues as second port in the United States in importing crude rubber, with New York first. During June 2,318 long tons of rubber were entered at Boston; while Philadelphia, the next port in importance, received 1,437 long tons, and Baltimore 1,311 long tons.

Sixteen corporations connected with the rubber manufacturing industry in Rhode Island, assessed on a corporate excess of $100,000 or more, are among the corporations paying taxes upon the corporate excess imposed under the state law by the State Division of Corporations. These sixteen concerns have a total corporation tax assessment amounting to $51,267.16 on a total of $12,354,357.83 of corporate excess.

CCC contracts for approximately $1,000,000 worth of rubber footwear were awarded at the United States Army quartermaster's depot at Boston, Mass. All but 17,000 of 333,000 pairs ordered will be manufactured by New England concerns. Those receiving contracts include: United States Rubber Products, Inc., Naugatuck, Conn., 186,159 pairs; Goodyear Rubber Co., Middletown, Conn., 18,100 pairs; Tyer Rubber Co., Andover, Mass., 12,250 pairs; Phillips-Baker Rubber Co., Providence, R. I., 24,527 pairs; Firestone Footwear Co., Boston, Mass., 33,360 pairs; Hood Rubber Co., Inc., Watertown, Mass., 89,146 pairs; Converse Rubber Co., Malden, Mass., 12,300.

Naugatuck Chemical, Naugatuck, Conn., according to Salesman George Follett, manufactures more rubber labels in its plant than does any other rubber factory in the world.

The Davol Rubber Co., Providence, R. I., named Donald A. Fries to succeed the late Oliver W. Gill as manager of the New York, N. Y., sales office with headquarters at 302 Broadway. Before the World War Mr. Fries was employed at the Davol factory in Providence. Subsequently he joined the sales organization and has since operated in the territory comprising New England, New York, New Jersey, and Pennsylvania. In his new post he will be assisted by Harold N. Chester, of Pittsburgh. Walter Englehardt has been promoted to Mr. Fries' former position.

Farrel-Birmingham Co., Inc., Ansonia, Conn., the week of June 24 held its annual sales conference attended by representatives from New York, New Jersey, Buffalo, Akron, Chicago, and Los Angeles. In the absence of President N. W. Pickering, who was in Europe, Vice President Carl Hitchcock presided at the opening session. The meetings were devoted to discussions of the company's products, with particular reference to engineering, manufacturing, and sales problems involved. These discussions were supplemented by visits through the shops. During the week the men were entertained by golf, fishing, a dinner, and other diversions.

Hope Webbing Co., Inc., Pawtucket, R. I., gave its employes, numbering nearly 500, a 5% increase in pay. This surprise announcement was made by Charles A. Horton, president and general manager, at an employes' outing July 20, who stated that the company decided to make the increase because business conditions are somewhat brighter in the webbing line and the company is optimistic of an improved future. The raise was all the more surprising to employes since no recent wage cut has gone into effect. The company was established in 1882. Officers, besides Mr. Horton, are Attmore A. Tucker, vice president, treasurer, and purchasing agent; Clinton A. Pray, secretary; and F. E. Havens, assistant treasurer.

Alex Schulman, president of A. Schulman, Inc., 608 Akron Savings & Loan Bldg., Akron, O., has announced the installation of a new branch at 250 Stuart St., Boston, Mass., under the management of Dave Linquist, previously manager of the St. Louis, Mo., office and warehouse. Frank Francis is now manager of that branch. The branch warehouses have complete stocks of all types of rubber scraps and hard rubber dust to serve foreign as well as domestic trade.

"Increased business activity, definitely pointing to better times, plus our desire to provide better service for our friends in the New England rubber factories, prompted us to engage in this expansion," President Schulman said. "Our newly established branch office may be taken as an indication of our own faith in the improvement of business conditions and as an effort on our part to better serve our clients in that region."

Alex Schulman

Ohio

(*Continued from page* 49)

Paul W. Litchfield, president of The Goodyear Tire & Rubber Co., Akron, arrived in New York, July 25 after a trip around the world, during which he visited six of the company's plants in operation. He immediately left for Akron to spend his sixtieth birthday with his family. The purpose of the Litchfield trip was to open the newest Goodyear factory in Java and to look over the 93,000-acre rubber plantations of the company in Sumatra. Though Goodyear has been raising rubber in Sumatra since 1916, this was Mr. Litchfield's first trip to the Far East. During his journey he inspected the company's 37,000-acre cotton plantation in Arizona and its tire factories in Los Angeles, Calif., Sydney, Australia, and Wolverhampton, England, and he stopped at Friedrichshafen, Germany, to discuss airship matters with Dr. Hugo Eckener and to look over the new Zeppelin, the LZ-129, now being completed. It happened that his stop at Friedrichshafen marked also his thirty-fifth anniversary with Goodyear.

The Patterson Foundry & Machine Co., East Liverpool, has appointed W. M. McConnell in charge of the drafting room of its engineering department. Mr. McConnell had previously been with the Koppers Co. and the American Cyanamid & Chemical Corp.

NEW JERSEY

RUBBER manufacturers in New Jersey are holding their own for this time of the year, with some reporting a slight decline in business. Factories are busy with certain products. Buying of hose and jar rings is increasing; while tire production remains the same.

Business so far this year is ahead of the 1934 figure for the same period. Improvement is expected during fall and winter because jobbers' shelves are empty, and volume buying should commence soon.

Prospects of greater taxes resulting from the Social Security Bill and the Wagner labor measure, which undoubtedly will increase costs of doing business, present a serious problem to manufacturers.

In most cases the end of the NRA had little effect on the rubber business. One report, however, indicated that at first a decided falling off of business resulted because buyers were delaying purchases in the hope that in the competition for business much price cutting would take place. But conditions in this respect have improved lately.

Lambertville Rubber Co., Lambertville. The calender department went on strike when the company refused to take back a former employe. The company has threatened to hire new workers if the strikers do not return. Lambertville Rubber, however, has plenty of prepared material on hand; so the department will remain closed a while. The Boston Quartermaster Depot has awarded a contract to the company for 6,400 pairs of overshoes for the United States Army.

Pierce-Roberts Rubber Co., Trenton, has cut out the night shift because of declining orders, but all day hands are still at work.

D. A. Shirk, president, Rare Metal Products Co., Belleville, N. J., with Mrs. Shirk and their two daughters sailed for Germany, June 3, on the "George Washington." Mr. Shirk is combining business with vacation and expects to return to New York on August 20.

John Waldron Corp., New Brunswick, manufactures a diversified line of machinery for several industries, including rubber, paper, and textiles. The firm also cooperates with rubber manufacturers in the development of machinery for use with latex. Company executives include Charles C. Willis, president and general manager; J. O. Ross, vice president; A. G. Robinson, secretary-treasurer; Lynn B. Case, chief engineer; John R. Dunham, superintendent; and J. V. Riley, purchasing agent and office manager. Waldron, which was founded in 1827, has offices at 201 N. Wells St., Chicago, Ill.; and 350 Madison Ave., New York, N. Y., where is also located the J. O. Ross Engineering Corp., an affiliate organization.

Acme Rubber Mfg. Co., Trenton, announced that while June did not come up to expectations, business is much better than this time last year, with more inquiries for goods.

Mercer Rubber Co., Hamilton Square, finds business holding up very well.

Essex Rubber Co., Trenton, reports a little increase in business in all lines.

Tingley-Reliance Rubber Corp., manufacturer of tire accessories and mechanical rubber goods, 6-30 Ross St., Rahway, according to Wm. Rand ran its molded goods department three shifts for the past few months, but is now using two, a very good schedule for this time of the year. Wm. McCollum is company president, and P. N. Furber vice president.

Fairchild Aerial Surveys, Inc.

Airplane View of Titanium Pigment Co. Plant at Sayreville, N. J., on Raritan River, with Wharf Facilities for Ocean Going Vessels

Jos. Stokes Rubber Co., Trenton, is experiencing unchanged business at both the local and Canadian plants.

Puritan Rubber Co., Trenton, finds mid-summer busy. Prospects are good.

The Thermoid Co., Trenton, held its national convention July 12 and 13 at the Stacy-Trent Hotel, Trenton, attended by forty representatives from various sections of the country. The principal speakers were President Frederick Schluter, George Fabel, and Charles A. Crane. Following the session the company was host at an outing at Flemington. More than 3,000 persons went, including employes of The Thermoid Co., Woven Steel Hose & Rubber Co., and the Thermoid Textile Co. The Thermoid Co. continues busy with enough orders on hand to insure a good summer.

Whitehead Bros. Rubber Co., Trenton, installed a new elevator system in the plant at a cost of $2,500.

Red Raven Rubber Co., 152 Sussex Ave., Newark, recently had a portion of its factory damaged by fire.

The Rubber Manufacturers Association of New Jersey soon will hold its annual outing at the Trenton Country Club.

The Thiokol Corp., Yardville, reports business is very good and shows an increase over that of 1934.

The Michelin Tire Co., Milltown, has transferred its property valued at $1,500,000 to the Michelin Realty Corp. The transfer includes the tire plant and 185 dwellings, 182 in Milltown and 3 in New Brunswick. As the realty company, in all, owns 200 dwellings, the transfer is for convenience and not for sale. J. Hauvette Michelin is president of the realty concern.

Bruce Bedford, president of the Luzerne Rubber Co., Trenton, has been appointed to the advisory board to prepare plans for public works at Trenton.

The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, through its Employes Mutual Benefit Association on July 21 held its third annual bus ride to Rye Beach, N. Y. About 400 attended. James McElwee is president of the association.

Cotex Corp., Newark, manufacturer of rubber coated fabrics, has instituted in the Federal District Court an action to recover a fine of $1,000 for violation of an NRA code. Citing the unconstitutionality of the act, the company has applied to Judge Philip Forman for an order restoring the fine. The corporation recently pleaded guilty to ten charges, involving price regulations, and was fined $100 on each. Harlan Besson, district attorney, asking time to file an answering brief, declared the judge's decision "might affect other fines—$100,000 or more—paid in other parts of the country."

OBITUARY

Lester B. Chisholm

LESTER B. CHISHOLM, textile expert, who died July 9 at his home in Edgewood, Providence, R. I., was a contact manager of United States Rubber Products, Inc., Providence. After graduating from Tufts College about twenty years ago he entered the textile field. For several years he was general manager of Everlastik, Inc., Chelsea, Mass., and then held a similar post with the American Mills Corp., Waterbury, Conn. Next, for two years, he was general manager with the Moore Fabric Co., Pawtucket, R. I.

Private funeral services were held at his home July 12.

Robert A. Kincaid

ROBERT A. KINCAID, who died recently, for many years was president of Denver Rubber Goods, Inc., 1643 Arapahoe St., Denver, Colo., which he founded. Prior to that he had sold the Denver Rubber Co., which he organized in 1889, because of failing health.

Mr. Kincaid, who was born in Brooklyn, N. Y., April 15, 1858, and educated in the local grade schools, came to Denver in 1883. He had been prominent in the National Guard in New York and in the Chaffee Light Artillery in Denver. Mr. Kincaid also won prominence in the Masons and the Elks.

A widower, he is survived by two sisters, a niece, and a nephew.

Wm. O. Rutherford

DEATH removed another prominent figure from the ranks of rubber executives when William O. Rutherford succumbed on July 18 after an appendectomy. He had been president and a director of the Pennsylvania Rubber Co., Jeannette, Pa., from May 17, 1928, until his resignation December 10, 1934. Prior to that connection he had been with the B. F. Goodrich Co., Akron, O., the sales force of which he joined in 1900. He represented the firm in Detroit, Mich., and later was made branch manager, first at Denver, Colo., and then at Buffalo, N. Y. He next returned to Akron to become assistant to the vice president. He was made assistant general sales manager in 1914, general manager in charge of sales 1916, and second vice president in charge of sales and a member of the executive committee in 1918. He left Goodrich in January, 1928.

Mr. Rutherford had been a vice president of the Rubber Association of America in 1922 and a director and president three times, first in 1924. During the existence of the NRA he had been an alternate member of the trade practice complaints committee and of the code authority, both for the tire manufacturing industry. He also served

Wm. O. Rutherford

as head of the foreign trade commission of the Motor and Accessory Manufacturers' Association in 1922 and became a director and its president in 1923. He had been a director of the Lincoln Highway Association and the Pan-American Highway Education Board. Mr. Rutherford, furthermore, had been a 32nd degree Mason, Shriner, Knight Templar, a member of the Portage Country, Akron City, and Detroit Athletic clubs, and a life member of the Army of Santiago.

The deceased was born in Fairview, Pa., in 1874. He attended grammar school and an Akron business college. In 1898 he became an officer in the Eighth Ohio Volunteers, Spanish American War.

Surviving are his widow, a son, and his father.

Funeral services were conducted July 20 at the Episcopal Church in Salem, Mass., near his summer home.

Owen Hughes

OWEN HUGHES, with the National India Rubber Co., Bristol, R. I., for sixty-one years prior to his retirement May, 1931, died suddenly July 18. His first job, as a boy of twelve, was in the footwear department. Later he was transferred to clothing, where he remained thirty-five years. He was head cutter when the plant discontinued the manufacture of rubber clothing twenty-eight years ago. His last twenty-four years with the company were spent as watchman at the main gate.

Mr. Hughes was born in New York, N. Y., February 9, 1858.

He is survived by his wife and seven children, two of whom officiated at his solemn high requiem mass July 22.

Henry Z. Cobb

HENRY Z. COBB, 69, development engineer at the United States Rubber Co.'s Providence, R. I., plant, died July 20. His obituary will appear in our next number.

NEW PUBLICATIONS

"The Oak Leaf," July, 1935. The Oak Rubber Co., Ravenna, O. A breezy bulletin from Balloondom.

"Microscope Accessories." Bausch & Lomb Optical Co., Rochester, N. Y. This attractively printed and illustrated catalog covers all the many accessories required for the equipment of the microscope for every scientific and technical study.

"The Brush Phase of Motor Maintenance." The Ohio Carbon Co., 12508 Berea Rd., Lakewood, O. This new and enlarged edition is available on request. It has been brought up to date and shows the company's testing methods for maintaining its standards of quality.

"Alemite Powergun Equipment Catalog." Alemite Corp., Chicago, Ill. In the 25 pages of this revised mid-year 1935 catalog are presented, in natural colors, all equipment and accessories necessary for every kind of a complete, money-saving lubrication job. Full details and specifications likewise are given.

"TAG Industrial Thermometers." C. J. Tagliabue Mfg. Co., Park and Nostrand Aves., Brooklyn, N. Y. This catalog, No. 1125, contains 24 pages of conveniently arranged listings of the complete TAG line of industrial thermometers, miscellaneous and wood-back thermometers, hygrometers, U-gages, mercurial vacuum gages, and mercurial barometers.

"Proceedings and Papers of the Fifth Conference of the Technical Experts in the Printing Industry and Organization Meeting of Graphic Arts Research Bureau Held in Philadelphia, Pa., October 8-9, 1934." American Society of Mechanical Engineers, 29 W. 39th St., New York, N. Y. Among the papers reported are "Rubber Plates for Letter-Press Printing," by Ralph H. Schwarz and J. Homer Winkler, and "Observations on the Technology of Rubber Plate Manufacture," by W. J. Roscoe, with discussions by H. W. Haydock, Hylton Swan, E. M. Frankel, Henry Kohlus, J. G. E. Wright, and W. M. Lee.

"Courses in Chemical and Metallurgical Engineering. Undergraduate and Graduate Programs." University of Michigan Official Publication, Ann Arbor, Mich. 1935. This bulletin describes the ample facilities afforded by the College of Engineering of the University. The chemical engineering course includes chemical technology of the organic industries in which the technology of rubber is treated directly in several courses and opportunity is offered in advanced courses for further specialization. Copies of this bulletin may be secured by addressing Alfred H. White, Professor of Chemical Engineering, at the University, Ann Arbor, Mich.

EASTERN AND SOUTHERN

INDUSTRIAL activity in nearly all divisions has made a pronounced recovery since the holiday let down the beginning of July, and, in many instances, schedules are exceeding those of a year ago by a higher percentage than at the close of June.

Although new business has been lighter because of the rush of buying prior to the recent price advance, manufacturers of machine tools and machinery have enough orders to maintain current schedules well into the fall, and fair-sized commitments have been received for 1936.

A New York rubber manufacturer, stating current business is about 50% greater in volume than for the same period last year, expects a boom fall season. In fact business seems the best in several years. The uncertainty regarding the cotton processing tax, however, makes business uncertain beyond January 1. The disqualification of the NRA has increased the volume of trade, but decreased profits.

Footwear manufacturers in the state are witnessing the usual seasonal decline. The volume of business so far this year compares favorably with the corresponding period in 1934, although it is somewhat lower. A general pickup is expected in early fall, to continue throughout the winter. The first few days after the death of the NRA saw a depressing effect on the trade, but this soon was overcome to a great extent.

Volume business in fabrics for the rubber industry the first half of 1935 was a little higher than in the first half of 1934. It is expected that tire production and sales will be substantially reduced the remaining five months of the year because of low automobile output and seasonal declines. The disqualification of the NRA did not affect the fabric business.

Carolina textile mills are generally observing the former wage-and-hour provisions of the code. They are preparing, however, to resist in the courts the further collection of the cotton processing tax.

An Eastern chemical manufacturer finds business so far the same in volume as at this time last year. Most buyers anticipate increased volume for late fall and early winter.

Far Eastern Representatives, Inc., brokerage house, recently moved to 15 Moore St., New York, N. Y.

The United States Rubber Co., 1790 Broadway, New York, N. Y., will redeem its 6½% serial notes, series K, due March 1, 1936, on September 1, 1935 at 100½ and accrued interest. The amount of these notes called for payment is $1,485,000. This plus a series of 6½% notes paid March 1 will reduce the funded debt by $2,970,000 since the first of this year.

R. M. A. Notes

The Rubber Manufacturers Association, Inc., 444 Madison Ave., New York, N. Y., announced recently that the hard rubber division had gone on record as approving in principle a continuation of wage and hour policies with respect to the basic forty-hour week, minimum wages, and abolition of child labor. This division of the rubber manufacturing industry embraces thirty companies with an annual wholesale value of sales amounting to approximately nine million dollars. While operations were conducted under the NRA code, wage and hour provisions were carefully observed. Employers now believe that the advantages enjoyed by both themselves and their employes should be continued on a voluntary basis.

At a meeting of the rubber footwear manufacturing industry a resolution was adopted unanimously by all companies engaged in the industry to the effect that they will continue the wages and hours, also child labor limitations, under which the industry has been operating. The companies adopting the resolution were: Beacon Falls Rubber Shoe Co., Beacon Falls, Conn.; Cambridge Rubber Co., Cambridge, Mass.; Converse Rubber Co., Malden, Mass.; Endicott Johnson Corp., Endicott, N. Y.; Firestone Footwear Co., Hudson, Mass.; B. F. Goodrich Co. (Footwear Division), Watertown, Mass.; Goodyear Glove Rubber Co., Naugatuck, Conn.; Goodyear Rubber Co., Middletown, Conn.; Hood Rubber Co., Watertown, Mass.; La Crosse Rubber Mills Co., La Crosse, Wis.; Lambertville Rubber Co., Lambertville, N. J.; Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind.; Phillips-Baker Rubber Co., Providence, R. I.; Servus Rubber Co., Rock Island, Ill.; Tyer Rubber Co., Andover, Mass.; United States Rubber Co., Naugatuck, Conn.

The annual wholesale value of the products of the rubber footwear manufacturing industry is about fifty million dollars.

This action of the rubber footwear manufacturers is all the more significant in view of the fact that in the manufacture of rubber footwear labor represents more than one-third the manufacturing cost, a much higher proportion than in most other products.

In connection with this policy of maintaining wages and hours, it is interesting to note that at the present time the wholesale prices of rubber and canvas rubber-soled footwear are lower than their average prices for the past five years. These low prices have been achieved despite the fact that the price of crude rubber is four times as high as it was three years ago and the price of cotton, the other principal raw material in rubber footwear, is more than three times as high, including the processing tax, as it was three years ago, and despite the fact that labor costs have risen appreciably. Of equal significance is the fact that the quality of rubber footwear has been steadily improved through research and is now better than ever.

The Heel and Sole Division at a recent meeting also approved in principle a continuation of wage and hour policies with respect to the basic 40-hour week, minimum wages, and abolition of child labor. This division embraces over fifty companies with an annual wholesale value of sales amounting to approximately twenty million dollars.

I. Drogin, Ph.D., chief chemist, J. M. Huber, Inc., 460 W. 34th St., New York, N. Y., returned to New York, July 8, from an extended trip to the West Coast. He delivered an illustrated lecture at a meeting of the Los Angeles Group, Rubber Division, A. C. S., June 13 on "Some Practical and Scientific Aspects of Carbon Black Manufacture and Use." A similar address was given at a later date before the San Francisco Paint Club.

J. J. Stunzi, general manager and treasurer of Caoutchouc Laboratories, Inc., announces the establishment of a New York, N. Y., office at 1450 Broadway. The factory of this company at Northampton, Pa., produces a specialty latex yarn in various thicknesses. It will be marketed in two types, covered and uncovered, the former in both cotton and silk. Mr. Stunzi states that this material is being made under a newly patented process.

Rubatex Products, Inc., 277 Park Ave., New York, N. Y., has leased the factory of the former Bedford Tire & Rubber Co., Bedford, Va., so as to expand production facilities to meet the requirements of its rapidly growing business. Equipment of the small Rubatex factory in Baltimore was added to that of the new plant, and production operations began July 15. According to Sidney E. Kienitz, sales manager, this company holds exclusive American rights to the British Onazote patents and manufactures auto parts, boat fenders, dry ice blankets, insulated board and tubing, gasketing, and many special-purpose articles of a waterproof nitrogen impregnated cellular type of rubber that has a wide range of density and from featherlike softness to a hard board having the appearance of cork or balsa board, but with a bulk weighing only four pounds per cubic foot. Dudley Roberts is president, F. W. Peel, vice president and general manager, and Robert E. McCormick, secretary of Rubatex Products, Inc.

The Engineers' Council for Professional Development, 29 W. 39th St., New York, N. Y., will accredit engineering schools in New England and the Middle Atlantic States. The program will be offered to other parts of the country after a trial period in these two regions. Notice is being sent to the presidents of all degree-granting engineering schools in the two areas advising them that the Engineers' Council stands ready to receive requests for consideration of particular engineering curricula which the schools may wish to submit. Accrediting is necessary at present for a number of reasons, the most urgent of which is the fact that a majority of the states have enacted laws for licensing engineers and that procedure requires a list of accredited colleges whose graduates may submit evidence of their graduation in partial fulfillment of the requirements of licensure. The constituent organizations of the Engineers' Council for Professional Development are: American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Institute of Electrical Engineers, Society for the Promotion of Engineering Education, American Institute of Chemical Engineers, and National Council of State Boards of Engineering Examiners.

Consolidated Products Co., Inc., 15 Park Row, New York, N. Y., recently purchased all the machinery and equipment of the General Rubber Fabrics Co., Reading, Mass. The equipment, consisting of mills, calenders, tubers, presses, etc., is to be sold and removed in dismantling the plant.

Sports Shoes

The Bureau of Internal Revenue has been asked to rule on whether certain types of shoes should be taxed as sporting goods imposed by section 609 of the Revenue Act of 1932 at 10%.

Article 53 of Internal Revenue Regulations 46 reads in part as follows:

"The term 'sporting goods' includes all articles of the same general character as those specifically named, the purpose of which is primarily for use either indoors or outdoors in connection with a game or sport."

The bureau has held that the following types of shoes are articles commonly or commercially known as sporting goods, within the meaning of the law and regulations, and are, therefore, taxable under section 609:

(1) Rubber soled shoes with cleats made of rubber or leather, or otherwise so designed or constructed as to limit their use to a specific sport.

(2) Shoes constructed with a cleated or caulked heel and/or sole regardless of the material with which soled, normally used as golf shoes.

(3) Shoes constructed with one sole of leather and one sole of rubber, or with a sole made of a combination of rubber and leather, ordinarily used as bowling shoes.

The following types of shoes are not considered articles commonly or commercially known as sporting goods, and are not, therefore, subject to tax under section 609:

(1) Rubber soled shoes with leather or canvas uppers, in either high or oxford styles, with lace-to-toe or closed-toe construction, unless they are designed or constructed with some feature which distinguishes them as adapted to a specific sport.

(2) Ordinary shoes with rubber soles, but without a cleated or caulked heel and/or sole.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has announced that on July 1 the business conducted by the Pacific R & H Chemical Corp., with offices in El Monte and San Jose, both in Calif., was continued as a unit of the du Pont company, to be known as the Pacific Division of The R. & H. Chemicals Department, E. I. du Pont de Nemours & Co., Inc.

Combustion Engineering Co., Inc., 200 Madison Ave., New York, N. Y., made Theodore H. Ross, Pittsburgh, Pa., district sales manager of its Industrial Stoker Division.

New York Rubber Corp., Beacon, N. Y., according to Sales Manager W. Rogers, is enjoying the best business in several years. The firm is working three shifts.

United States Rubber Products, Inc., Mechanical Goods Division, 1790 Broadway, New York, N. Y., has announced the following organization changes: W. S. Long, formerly manager of mechanical sales in the Seattle, Wash., district, transferred to the Los Angeles, Calif., district as manager of mechanical sales; C. W. Gilmer, formerly salesman in the San Francisco, Calif., district, to succeed Mr. Long at Seattle; Arch Miller appointed packing representative in the Pittsburgh, Pa., district by J. W. Greenawalt, manager of mechanical sales there. The New Orleans, La., branch moved from 202 Fulton St. to 440 Canal St. E. J. Espenan is operations manager there; M. L. Puckett, district manager for footwear and rubber clothing; R. L. Whisler, district manager for U. S. tires; and N. J. Pierce, manager of the mechanicals department.

MIDWEST

THE rubber industry in the Midwest is enjoying a volume of business somewhat above that of 1934. Only a normal seasonal improvement is expected for fall and winter. The discontinuance of the NRA has not affected the trade, for most firms are still abiding by the terms of the NRA code for the rubber manufacturing industry.

The decline in production in the automobile industry is no more than seasonal. May output greatly exceeded the figure in May, 1934, keeping the 1935 total in advance of production in the same period last year. The output in June, on a daily basis, equalled that of May.

L. P. Fischer, sales promotional representative of the Bowes Seal Fast Corp., Indianapolis, Ind., has just returned from an 8 months' trip around the world in the interest of the company's foreign business.

The Hydraulic Press Mfg. Co., Mt. Gilead, O., recently established a sales office at 2842 W. Grand Blvd., Detroit, Mich. It is a direct factory branch in charge of Reider Thoreson, who has been with the company ten years in engineering and sales work. Michigan, northwestern Ohio, and northeastern Indiana will be served from Detroit.

Herron & Meyer, 38 So. Dearborn St., Chicago, Ill., dealer in crude rubber, liquid latex, tire fabrics, carbon black, and clay, according to A. L. Meyer has been made exclusive sales agent for the Midwest territory by the American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y., to handle its full line of rubber chemicals, accelerators, and other compounding ingredients for the rubber industry.

The Industrial Rubber Goods Co., St. Joseph, Mich., through President F. C. Palenske has announced that it is erecting a new brick and steel building 50 by 225 feet. Part of this structure will be equipped as a machine shop; while the balance will be used for warehouse purposes. The firm manufactures automobile supplies and mechanical rubber goods.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	Inquiry
1787	Manufacturer of porous hard rubber.
1788	Names of books on the compounding and curing of articles made from latex.
1789	Manufacturer of vulcanizers.
1790	Manufacturer of all-rubber socks.
1791	Information wanted on the dielectric properties of articles made from Koroseal.
1792	Manufacturer of rubber for printing plates.
1793	Manufacturer of rubber finishes.
1794	Manufacturer of dusting talc.
1795	Manufacturer of reodorants.
1796	Manufacturer of rubber substitutes.
1797	Manufacturer of softeners.
1798	Manufacturer of rubber colors.
1799	Manufacturer of mold lubricants.
1800	Manufacturer of activators.
1801	Manufacturer of dispersing agents.
1802	Manufacturer of reclaiming oils.
1803	Manufacturer of reenforcers.
1804	Manufacturer of stabilizers for cure.
1805	Manufacturer of varnishes.
1806	Manufacturer of blowing agents for sponge rubber.
1807	Manufacturer of softening oils.
1808	Manufacturer of rubber solvents.
1809	Manufacturer of antioxidants.
1810	Manufacturer of tacking agents.
1811	Manufacturer of abrasives.
1812	Manufacturer of rubber fillers.
1813	Manufacturer of tire molds.
1814	Manufacturer of mold makers in the New York metropolitan district.
1815	Manufacturer of "Myrcene."

(Continued on page 70)

Rubber Industry in Europe

GREAT BRITAIN

Rubber-Tar Mixes

A series of experiments incorporating rubber with tar products chiefly to improve road surfacing materials was carried out by David D. Pratt and Roy Handley on behalf of the Technical Research and Development of New Uses Committee, and their report has been published in the bulletin of the Rubber Growers' Association. They found that vulcanized or unvulcanized rubber is readily introduced into previously dephenolated low-temperature or vertical retort tars either by dissolving the rubber in selected tar oils and adding the desired proportion of pitch or by homogenizing the prepared tar direct with latex with subsequent removal of water.

Vulcanized rubber is also compatible with horizontal retort tar, but when this tar is used with unvulcanized rubber, a diluent must be added. Low-temperature tar oil is a suitable diluent, and, to a lesser degree, horizontal retort tar oils previously freed from crystalline material.

Experiments were also conducted incorporating rubber into pitch using a volatile tar oil, preferably low-temperature tar oil, as "carrying medium." The volatile tar oil dissolves both rubber and pitch and can be removed by steam distillation. A series of pitch-rubber mixtures were prepared containing from 10-90% of rubber. The addition of even a small percentage of rubber to pitch greatly increases its toughness; naturally, the higher the rubber content, the greater the toughness of the pitch-rubber mix.

The various products obtained in the course of the experiments are now being studied particularly in regard to viscosity-temperature relations and are further to be tested as road materials.

All Rubber Pipe-Joint

Much interest is displayed in a new all-rubber pipe joint invented by A. S. Baxendale which, consisting of a vertical washer and horizontal gaskets, provides not only a horizontal but also a vertical seal. Washers and gaskets are fitted into the socket end of the pipe into which the spigot end of the next pipe, spread with latex, is inserted. It is claimed for this new joint that with it the enormous leakage of gas and water due to faulty jointing is eliminated as it is perfectly leakproof. The rubber is not only durable, but becomes more firmly set with the passage of years. Since the all-rubber joint insulates each pipe from the next one, the conditions favoring the generation of the flow of current that produces the worst forms of electrolytic corrosion are prevented. The joint can be fitted in less than two minutes by any untrained workman before the pipe is lowered into the trench so that widening the trench at every joint to allow elbow room for "caulking" becomes unnecessary, thus permitting considerable savings in the cost of trenching. Further savings in this direction will become possible when asbestos cement pipes with rubber jointing are used instead of the metal pipes with metal joints, for then pipe lines could be laid at a depth of 2 or 2½ feet instead of at 3 or 3½ feet as at present.

If tests with rubber-jointed asbestos cement pipes prove successful, it is foreseen that such pipes which have no corrodable parts will eventually replace present systems of gas and water distribution. As each joint requires 1½ pounds of pure rubber, a valuable outlet for rubber would thus be afforded.

Noise Abatement Exhibit

The Rubber Exhibition, held at the Science Museum, South Kensington, London, for six months, was transferred to Manchester on June 4. Whereupon the Anti-Noise League opened its Noise Abatement Exhibition at the Science Museum from May 31 to June 30. Much interest was shown in a demonstration of the greater quietness obtained with a sound-proof floor supported on rubber isolators as compared with an ordinary floor. Attention was also attracted by a silent elevator with a gate specially designed with ebonite track and rubber buffers. In the transport section was a pneumatic road drill in which noise is claimed to have been reduced at least 60% by fitting silencers to the hammer and wrapping the whole hammer in asbestos, felt, glass wool, and sheet rubber. Rubber flooring in steel trays was used for the model ticket hall floor exhibited by the London Passenger Transport Board. It seems that this type of floor is being installed in all the board's new or rebuilt stations.

British Notes

For the third time in thirteen months the price of tires is to be raised. This latest increase will amount to 5% on tires for light cars, 10% on standard tires for most automobiles, and 15% on tires for busses and trucks.

Consolidated Rubber Manufacturers, Ltd., was recently formed to produce, manufacture, and deal in rubber, vegetable and other gums, chemicals, fabrics, preparations, solutions, etc. The directors are Wm. A. Eden, Quebec, Canada; Wm. de Kraft, New Jersey, U. S. A.; Reed P. Rose, New York, managing director of International Latex Processes, Ltd.; F. Francis N. Pickett, Chairman of Rubber Regenerating Co., Ltd.; and Sir Malcolm Campbell. The nominal capital of £600,000 is in 500,000 5½% non-cumulative preferred shares of £1, and 1,000,000 common shares of 2s.

At an extraordinary general meeting on May 30 Universal Rubber Paviors, Ltd., Manchester, resolved it would wind up voluntarily. David Walkinshaw and George William Walker were appointed liquidators. The company had previously filed a declaration of solvency. On June 14 Universal Rubber Paviors, Ltd., was registered with a nominal capital of £150,000 in £1 shares to acquire the undertaking of Universal Rubber Paviors, Ltd., and to manufacture rubber paving blocks, other road materials, and rubber goods of all kinds.

The Goodyear Tire & Rubber Co., (Great Britain), Ltd., reports net profits of £143,908 for 1934, against £109,913 in 1933 after £14,584 was written off debenture issues and discount and £15,450 deducted for premium on debentures redeemed. Total dividends for last year came to 15% against 10% the year before.

Another five-story factory is to be built by the Bata Shoe Co. at East Tilbury.

A pneumatic tent which has no poles, but which can be put up in four minutes by inflating the tubes with a pump, is announced by Imperial Chemical Industries, Ltd. This tent measures 7 feet by 7 feet by 6 feet 3 inches high and can be packed up to stow away easily in the car.

Employment conditions in Birmingham are now equal to those of pre-war days.

Germany

In *Gummi-Zeitung*, Werner Esch recently discussed discolorations due to certain accelerators and antiagers in vulcanized rubber and also in materials consisting largely of cellulose, as paper

and cotton, which have come in contact with vulcanized rubber. Thus the white cotton covering of rubber thread may show yellow discolorations which turn red and finally brown even when the rubber contains only sulphur and an antiager. If the latter is left out, no discoloration occurs, but then, of course, the rubber is not sufficiently resistant to aging. The use of Age-Rite White as an antiager in certain compounds seems to prevent this discoloration. Certain white mixes that remain white when exposed to light still have power to discolor paper which comes in contact with them. This may occur even when an accelerator like hexamethylenetetramine alone is used. Mr. Esch further reported discoloration of a white figure sunk into the red surface of a rubber ball colored with Vulcan red D.K.F. When he received the ball, the figure was pure white, but after only a few days a lemon yellow discoloration was noted which was confined to the surface and could be removed with an eraser. It may here be interpolated that decoration with sunken inlays is a new process that has recently been developed here and on which patent has been applied for.

From recent business reports of various German rubber companies it appears that the export business is still severely hampered by the restrictions imposed by foreign countries so that though several companies have increased sales at home, none increased foreign business. The government control of crude rubber purchases has not interfered with supplies, which, on the whole, are adequate.

The C. Muller Gummiwarenfabrik, A.G., reports especially good demand for its bathing, sports, and household articles, and the results for 1934 were more favorable than for 1933. Net profits came to 46,885 marks, and a 4% dividend was declared.

Gummi-Werke Elbe, A.G., had record sales for 1934. The firm produces mechanical goods, rubberized fabrics, certain surgical goods, footwear, thread, heels, soles, hard rubber combs, etc. Net profits for 1934 were over 83,000 marks, and a 5% dividend was declared.

The Harburger Gummiwarenfabrik Phoenix, A.G., Harburg, increased sales in 1934 by 27% as to value and 40% as to quantity. Net profits were 364,035 marks against 67,424 in 1933, and a dividend of 7% was turned out. The firm recently acquired licenses to produce rubber to metal products after an American patent, and a company, Ferroflex G.m.b.H., has been established for the purpose.

During April Germany exported 9,770 automobile casings as compared to 9,213 in April, 1934. Inner tubes exported from Germany during April, 1935, totaled 6,051 against 8,453 in the same period of 1934. Germany exported 619 solid tires in April, 1935, and 145 in April, 1934.

Poland

The number of rubber manufacturing firms still making a profit is practically balanced by the number meeting with business difficulties. In the former class are the Stomil company, Posen, which booked a profit of 162,500 zloty on a capital of 1,000,000 zloty; the Wargum, of Warsaw, capitalized at 500,000 zloty, which showed a profit of 79,176 zloty; the Sanok Rubber Co., Sanok, capital 1,500,000 zloty, profit, 215,200 zloty; Piastow, of Warsaw, capital 800,000 zloty, profit 200,107 zloty; and Cerata of Warsaw, capital 1,350,000 zloty, profit 75,000 zloty.

Kauczuk, of Warsaw, and Pepege, of Graudenz, the former capitalized at 860,000 zloty and the latter at 3,000,000 zloty, have both been in difficulties for some time, and their continued existence is rather doubtful. The Schweikert company, Lodz, reported a loss of 220,000 zloty; this company, one of the biggest Polish rubber manufacturing concerns, has a capital of 10,200,000 zloty and employs around 1,300 persons. Wolbrom, the oldest Polish rubber company, closed with a loss of 333,000 zloty; capital, 588,400 zloty.

These reports reflect the conflict in the local rubber industry necessarily resulting when a new industry expanding as rapidly as has Poland's rubber industry—and as uncontrolled—is suddenly faced by a world depression. Poland's rubber industry not ten years ago consisted of the single factory of the Wolbrom concern at Wolbrom. Today about twenty larger and smaller firms supply practically all the rubber needs of the local market except tires, besides exporting large quantities of rubber footwear. In 1929 Poland imported 28,600 quintals of rubber goods; by 1934 this figure had fallen to 10,000 quintals. In 1934 the factories employed about 12,000 workers and consumed 52,000 quintals of crude rubber, against 34,200 quintals in 1933, chiefly in making footwear, of which 9,630,000 pairs, value 27,340,000 zloty, were produced in 1934 against 6,900,000 pairs, value 19,200,000 zloty, in 1933. Of the totals 6,514 quintals, value 2,754,000 zloty, were exported in 1934, and 6,417 quintals, value 2,809,000 zloty, in 1933. The balance of the 1934 output, except for a stock representing about 10% of the total output, was put on the local market. The huge increase in output as compared with the slight increase in exports, together with the decrease in the value of exports, at once indicates where the trouble in Poland's rubber industry lies—unrestricted output and underselling.

Footwear imports have dwindled to 95 quintals, value 56,000 zloty, against 179 quintals, value 204,000 zloty. Pneumatic tires and tubes form the bulk of the imports and in 1934 came to 5,922 quintals, value 3,153,000 zloty, a marked decrease from the 9,338 quintals, value 5,334,000 zloty, of 1933.

Figures for the first quarter of 1935 would indicate that the Polish rubber business is not improving. Exports of rubber footwear fell from 172 tons, value 755,000 zloty, in the first quarter of 1934 to 31 tons, value 107,000 zloty, in 1935; imports of crude rubber were only 748 tons against 1,140 tons in the first quarter of 1934; imports of tires, 178 tons, value 860,000 zloty, against 175 tons, value 992,000 zloty.

This condition has not prevented the formation of a new asbestos and rubber goods factory at Lodz, the Leonowit A.G., with capital of 350,000 zloty.

Other European Notes

According to preliminary official statistics, Belgium exported 311,600 kilos weight of automobile and motor cycle casings during April, 1935, as compared to 605,100 kilos in the corresponding period of 1934. The number of automobile casings exported may be estimated at one for each 12½ kilos weight.

Under an order dated May 24 a quota of 596,500 pairs of rubber footwear may be imported into the Irish Free State from July 1 through December 31, 1935.

Battery containers of hard rubber and similar materials, heretofore dutiable under item 636 of the Spanish customs tariff, at 46 gold pesetas per 100 kilos, were reclassified by a circular order of the Director General of Customs, dated May 9, 1935, under item 637 bis, and are now dutiable at 1.50 gold pesetas per net kilo.

"My World Trip, 1934/5," to be published in September by *Gummi- und Asbestzeitung*, is the title chosen by E. A. Hauser, Ph.D., well-known rubber technologist, for a booklet containing complete reports in English, French, and German of his visits in U.S.A., Japan, China, Malaya, and Ceylon in the interest of latex and rubber technological progress. Copies of this booklet may be obtained through India Rubber World at $1 each.

Scrap and Reclaim Exports

United States exports of scrap and reclaimed rubber in the first five months of 1935 amounted to 27,218,825 pounds, value $642,691, an increase of 24% in quantity and 18% in value over exports the same period of 1934.

Reclaimed rubber, for use in the rubber manufacturing industries of Canada, United Kingdom, Australia, Argentina, Cuba, and Mexico, amounted to 5,008,102 pounds, value, $242,964. Scrap rubber was destined for two general uses abroad—as reclaimed rubber after being subjected to reclaiming processes in the rubber manufacturing industries of Canada, Argentina, France, Germany, and the United Kingdom; and as the product from which a rough and low-priced rubber footwear is made in Spain, China, and Hong Kong.

Rubber Industry in Far East

MALAYA

Restriction Complaints

Despite the fact that restriction has been in force almost a year, complaints about unfair assessments are heard almost as frequently as in the early months of the scheme. We still hear that many of the larger estates are over-assessed while medium and smaller ones are under-assessed; that especially the older areas of the former, assessed on the more or less forced outputs of 1929-1932, are now in poor condition and cannot produce their quotas. The big concerns, it is explained, with their large overhead often found it more economical to tap to the limit instead of closing down; while the smaller estates tapped only a part of their areas or not at all. Big estates, it is further complained, only have to produce their yield records to get their—often—unduly high assessment; while the smaller ones are inspected by not altogether disinterested persons.

Most of this talk has to be taken with the proverbial grain of salt. Remembering, however, the high outputs maintained by Malaya throughout the slump, no doubt lasts that much over-tapping occurred, and quite probably the estates concerned now suffer from impaired yielding capacity. Whether these estates are all, or even for the most part, big estates, is, of course, another question.

Meantime it is a fact that numbers of estates are contemplating manuring programs either to bolster up yields or to improve areas which have deteriorated because of neglect over a number of years.

Manuring or Forestry?

The great interest in soil improvement is apparent from the amount of discussion on the pros and cons of manuring and, to a lesser degree, of forestry methods. Manuring with artificial fertilizers improves the foliage, general growth and vigor of the trees, thickness of bark and bark renewal, chiefly on younger areas and backward areas. But perhaps too much is made of their effect on bark and yields. It is pointed out that thin bark is the main factor limiting yield on older estates, and it is believed that regular manuring over a period of years will lead to higher yields when the tapping cut returns to the panel renewed under manured conditions. Unfortunately experience has too frequently been disappointing. Against the instances where good results have been obtained—on special types of soils—are too many where precisely these older areas with thin bark and dwindling yields responded very little, if at all, as far as yield is concerned. After all no definite relation exists between yield and thickness of bark in the case of seedlings although a certain correlation has been found for budded trees. But even here some clones respond less readily to treatment than others.

But even if manuring did improve yields in most cases, there is still the question whether it pays. A few years ago, when, of course, rubber prices were much lower than they are now, scientists declared that under existing conditions it did not pay. Many people believe this statement still holds good. A still more pertinent question has been put: namely, with a restriction scheme in force, is it sound economics to spend money on fertilizers to boost yields?

Many would like to adopt rubber forestry, but hesitate because adequate scientific guidance appears lacking. Again little or nothing is known about later costs of controlled forestry, the only kind worth attempting. Improvement in yield by forestry methods appears slow, and except in the few classic cases in Malaya, nothing is known of what it can do for an estate.

The present enforced restriction would seem to offer an unusual opportunity for testing forestry methods. All estates should have sections out of tapping; these would, in most cases, be the poorest or the youngest, and if natural growths, suitably controlled, of course, were allowed to develop here in the next few years, it should be possible to accumulate valuable data on this interesting and important subject.

The Burden of Taxation

Hardly a rubber company meeting takes place but mention is made, in more or less vigorous terms, of the burden of taxation Malayan planters now bear. At the annual meeting of the Parit Perak Co., the chairman pointed out that on the average estate payments to the government in all represent 12 to 15% of the price of rubber; while in terms of profit taxation might amount to 35 to 50%.

Others declare many estates may be unable to turn out any dividend because of these taxes. At present estates have to pay an export duty, the special tax for the cost of the restriction scheme, a cess to cover costs of the Rubber Research Institute of Malaya, and land rent on both planted areas and jungle reserves. The quit rent in most cases amounts to $4 (Straits currency) per acre per annum. Planters recently appealed unsuccessfully to the Governor to have this reduced.

Litchfield in Singapore

The president of the Goodyear Tire & Rubber Co., Akron, O., U. S. A., Paul W. Litchfield, arrived at Singapore on June 10, on his way from Java. Interviewed by a *Straits Times* reporter, Mr. Litchfield said:

"As far as I can see, there is no outstanding problem confronting the industry today. The Dutch authorities have the native rubber problem well under control and so long as the price does not rise to a level when the tax will appear too high, all should be well in that direction.

"Even the big estates can be profitably worked at present price levels if efficiently operated. The future of rubber is bright. Consumption should increase steadily with the discovery of new uses and the wider employment of rubber in spheres where it is already being used. This again would depend on the price. If it is allowed to go higher, consumption would naturally not increase as rapidly as it would if prices were maintained at present levels."

Two weeks before his arrival in Singapore production was started at the new Goodyear factory at Buitenzorg. Asked whether his company contemplated extending the idea of erecting factories in the Far East and whether Singapore would be selected as a site, Mr. Litchfield replied that much would depend on the Buitenzorg experiment.

India

Some time ago it was proposed to start a rubber goods factory in the state of Travancore. This plant, at Trivandrum, having been erected, will begin operations as soon as special electric cables for the power supply have been laid. Machinery worth over 200,000 rupees is being installed, and it is intended to produce tires, dipped goods, hose, rubber tiles, and rubberized fabrics. The crude rubber and china clay to be used will all be locally produced.

According to recent official figures, India's rubber imports during April 1, 1934 to December 31, 1934 included 2,225,693 pairs of rubber soled canvas

shoes, value 1,275,000 rupees, a considerable drop from the 4,909,941 pairs, value 2,375,000 rupees, in the corresponding period of 1933, that was caused by the heavy decrease in shipments from Japan, which were only half those of the preceding year. Other rubber soled footwear amounted to 124,502 pairs, value 50,000 rupees, against 80,226 pairs, value 50,000 rupees; all-rubber footwear came to 567,284 pairs, value 275,000 rupees, against 538,025 pairs, value 250,000 rupees.

Imports of pneumatic tires, keeping pace with increased imports of automobiles, especially from the United States, rose from 220,333 covers, value 8,050,000 rupees, to 247,429, value 9,050,000 rupees. Covers for motor cycles fell from 3,599 units, value 60,000 rupees, to 2,670 units, value 30,000 rupees. Pneumatic cycle tires also showed a decline, from 1,700,000 to 1,450,000 rupees. The greater part of all the tires came from England; next, but a long way behind, came the automobile tire shipments from the United States. These, however, showed a substantial increase in the period under review.

India's exports of crude rubber for the first quarter of 1935 were 5,014,465 pounds.

Japanese Methods

Dr. E. A. Hauser, well-known authority on latex, recently completed a world tour of six months visiting rubber manufacturing plants in Europe, the United States, and Japan, also plantation areas of the Far East. In the course of his journey he cooperated with many rubber manufacturers on chemical matters and addressed numerous scientific and business groups.

In a talk before the Singapore Rotary Club he definitely rejected the theory that the Japanese do not originate, but merely copy, stating that many new ideas in chemistry presented to him by Japanese would be adopted by him in Europe. He believes the rubber industry is not subsidized by the Government and says there is practically no waste in Japanese factories, where all operations are performed with skill and thoroughness. With respect to wages, while not on the same scale as those in most large industrial countries, this deficiency is made up for partly by the bonus system and heavy accumulations payable to employes on retirement, a policy which Dr. Hauser advocates for other nations.

Tennis Balls from Japan

According to statistics from the United States Department of Commerce, tennis ball imports from Japan during April, 1935, exceeded any previous month of record: 28,044 Japanese balls received, against 666 the same month last year.

NETHERLAND INDIA

New Levy on Rubber

The government plans a duty of ½ cent per half kilo on estate rubber when the market price at Batavia for standard sheet is between 17 and 18 cents a half kilo; when the price is from 18 to 20 cents, the duty is to be 1 cent, with an increase of ¼ cent for every cent over the market price of 20 cents.

It is estimated that with 30% restriction during 1936 and an average market price of 20 cents per half kilo, the duty will yield 4,600,000 guilders for the year. At the same time the government expects to be able to earmark 3,300,000 guilders of the receipts from the special duty on native rubber for general purposes.

While not wholly unexpected—an export duty on estate rubber has been under consideration by the government for some time—this announcement caused some perturbation among producers. It is pointed out that the present position of rubber companies hardly warrants a duty at a price of 17 cents per half kilo.

Quota Exceeded

Total shipments in May were in excess of the restriction quotas owing to the enormous shipments of native rubber from Netherland India, which amounted to 22,434 tons, against 13,823 tons in April; while the quota for native rubber was under 10,000 tons a month. In all, the excess of native shipments the first five months of 1935 approximated 21,000 tons. Estates meanwhile have consistently been below quota though the tendency has been to approach it more and more each month. In fact in May estate shipments were 14,398 tons, practically equal to quota. Nevertheless estate exports for the five months were around 13,000 tons short of quota. The enormous native shipments have so far offset this figure that Netherland India started June with excess shipments of about 8,000 tons; whereas she closed the first quarter of 1935 about 6,500 tons short.

The unusually heavy shipments were due to the announcement of increased export duty. The duty had been successively raised from 8 cents per half kilo to 9 cents, then 10 cents and starting June 16 to 11 cents per half kilo. It is learned that this has again been reduced to 10½ cents per half kilo, effective June 30.

Increased Remilling

Attention has already been called in these columns to the loss occasioned Singapore remillers by the increase in remilling in Netherland India since restriction. Several factories have been established in Borneo and Sumatra. In South East Borneo the Japanese firm of Nomura has several small factories which work up native rubber exclusively for export to Japan. The Japanese manufacturer, like the American, is using more and more remilled native rubber for most purposes instead of standard sheet and crepe.

One of the biggest—if not actually the biggest—remilling factories in Netherland India has been established in Sumatra between Belawan and Medan by the Chinese firm of Hok Lie. Judging from the description in the *Deli Courant*, the factory, as far as capacity is concerned, is still far behind the biggest of the Singapore works. It has a battery of seventeen mills, two electric motors, and extensive drying houses. Work goes on practically all day and night. Motor trucks penetrate to all parts of Northern Sumatra collecting the dirty, smelly native slabs to be brought to the factory and reworked into presentable brown crepe. The enterprise is said to be a typical Chinese business employing both Chinese and natives who are fed and housed by the owners and seem to be quite content. A certain number of women are also employed in the packing department.

New Goodyear Factory

On June 7 the newly completed Goodyear factory at Buitenzorg was opened by Paul Litchfield, president of the Goodyear Tire & Rubber Co., Akron, O., U. S. A., in the presence of a number of prominent persons. The governor-general was represented by the intendant of the palace, the general secretary, and the son of the governor. Among those present were also Mr. Hart, the director of Economic Affairs, the Governor of West Java, the regent and burgomaster of Buitenzorg.

The first Goodyear tire carcass and the first inner tube to be produced at the Buitenzorg factory will be presented to the Commercial Museum at Batavia to be on permanent exhibition.

Rubber Absorption Lower

World absorption of crude rubber in the first four months of 1935 amounted to 332,000 long tons compared with 337,000 tons in the corresponding period of 1934, a decline of 1.5%.

Increased rubber absorption indicating greater manufacturing activity in the January-April period of 1935, compared with that of 1934, was registered in the United States, an advance of 2%; Scandinavian countries, 9; Czechoslovakia, 39; and Australia, 75; while a declining absorption was noted in France, 12%; Germany, 19; Russia, 9; United Kingdom, 13; Canada, 15; Argentina, 25; Poland, 34; Japan, 9; and Mexico, 63.

Patents and Trade Marks

MACHINERY

United States

2,001,768. **Material Impregnator.** J. H. Campbell, Somerville, assignor to J. D. Moore, Dorchester, both in Mass.

2,001,777. **Tube Inflater.** E. Eger, Grosse Pointe Park, Mich., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,001,781. **Rubber Thread Apparatus.** J. R. Gammeter, Akron, O., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,002,110. **Inner Tube Vulcanizing Mold.** P. De Mattia, Passaic, N. J., assignor to National Rubber Machinery Co., Akron, O.

2,002,252. **Liquid to Powder Converter.** M. J. Stam, The Hague, Netherlands.

2,002,374. **Control System.** W. R. King, Schenectady, N. Y., assignor to General Electric Co., a corporation of N. Y.

2,002,391. **Ornamented Article Form.** A. L. Diller, Belmont, and L. H. L'Hollier, Waltham, assignors to Hood Rubber Co., Inc., Watertown, all in Mass.

2,002,552. **Specimen Supporter.** D. C. Scott, Providence, R. I., assignor to Henry L. Scott Co., a corporation of R. I.

2,002,579. **Tire Retread Vulcanizer.** W. G. Lerch, Akron, and A. W. Stoner, Findlay; said Lerch assignor of ½ of his entire right, and said Stoner assignor of his entire right to Master Tire & Rubber Corp., Akron, all in O.

2,002,629. **Spindle Drive Mechanism.** H. Z. Cobb, Providence, and R. S. Francis, Rumford, both in R. I., assignors, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,002,687. **Tire Building Drum.** A. E. Benson, Indian Orchard, assignor to Fisk Rubber Corp., Chicopee Falls, both in Mass.

2,002,795. **Immersing Machine.** S. Przyborowski, assignor to Fedders Mfg. Co., Inc., both of Buffalo, N. Y.

2,002,847. **Golf Ball Printer.** R. Atti, Union City, N. J.

2,002,954. **Centrifugal Separator.** H. O. Lindgren, Appelviken, Sweden, assignor, by mesne assignments, to De Laval Separator Co., New York, N. Y.

2,002,970. **Pneumatic Tire Apparatus.** H. Willshaw, Wylde Green, and F. A. Davenport, Birmingham, both in England, assignors to Dunlop Tire & Rubber Corp., Buffalo, N. Y.

2,003,092. **Liquid Bag Mold.** A. Richards, Providence, R. I.

2,003,566 and 2,003,567. **Retreading Mold Pressure Bag Circulating System.** H. J. Woock, assignor to Super Mold Corp., both of Lodi, Calif.

2,003,621. **Centrifugal Separator.** G. H. Andersson, Stockholm, Sweden, assignor to De Laval Separator Co., New York, N. Y.

2,003,673. **Moistureproof Cable Coverer.** G. Zapf, Cologne, assignor to Felten & Guilleaume Carlswerk A. G., Cologne-Mulheim, both in Germany.

2,004,085. **Rubber Thread Cutter.** K. R. Shaw, assignor to Easthampton Rubber Thread Co., both of Easthampton, Mass.

2,004,169. **Rubber Thread Conveyer.** F. S. Mead, Cranston, R. I., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,004,267. **Brake Lining Impregnator.** C. P. Brockway, Ridgewood, assignor to World Bestos Corp., Paterson, both in N. J.

2,004,517. **Laminated Fabric Splice Preparing Tool.** O. F. Homeier, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,004,797. **Collapsible Drum.** F. B. Pfeiffer, assignor to National Rubber Machinery Co., both of Akron, O.

2,004,800. **Tire Retreading Mold.** T. E. Rogers, assignor to A. B. Cleveland and J. E. Belden, jointly, all of Los Angeles, Calif.

2,004,886. **Tire Builder.** W. J. Breth and M. L. Engler, assignors to General Tire & Rubber Co., all of Akron, O.

Dominion of Canada

350,302. **Sole Trimmer.** United Shoe Machinery Co. of Canada, Ltd., Montreal, P. Q., assignee of E. C. Tyler, Leicester, England.

350,430. **Fabric Spreader.** Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of A. P. Lewis, New Bedford, Mass., U. S. A.

350,719. **Extensible Thread Tester.** Dunlop Rubber Co., Ltd., London, assignee of E. A. Murphy and R. G. James, co-inventors, both of Birmingham, all in England.

United Kingdom

424,378. **Collar Vulcanizing Mold.** P. Rougerie and J. Brousse, both of Asnieres, France.

424,592. **Hollow Article Vulcanizer.** D. Bridge & Co., Ltd., Castleton. (National Rubber Machinery Co., Akron, O., U. S. A.)

424,849. **Tire Retreader.** H. A. Gill, London. (Super Mold Corp., Lodi, Calif., U. S. A.)

425,261. **Tire Watchcase Vulcanizer.** Soc. Italiana Pirelli and G. Cozzo, both of Milan, Italy.

425,281 and 425,282. **Tube Vulcanizing Mold.** Soc. Italiana Pirelli, Milan, Italy.

425,352. **Tire Retreader.** H. A. Gill, London. (Super Mold Corp., Lodi, Calif., U. S. A.)

Germany

614,952. **Vulcanizing Press.** Deutsche Dunlop Gummi-Co. A. G., Hanau a.M.

615,600. **Machine for Kneading and Milling Crude Rubber and Mixes.** Societa Italiana Pirelli, Milan, Italy. Represented by A. Bursch, Berlin.

615,614. **Device to Equalize Air in Tubeless Tires.** Franz Kuhne, Dresden.

PROCESS

United States

2,001,785. **Inflatable Article.** V. H. Hurt, Naugatuck, Conn., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,002,204. **Treating Gutta Percha.** J. H. Ingmanson, Rahway, N. J., and G. S. Mueller, Richmond Hill, N. Y., assignors to Bell Telephone Laboratories, Inc., New York, N. Y.

2,002,261, 2,002,262, and 2,002,263. **Rubber Coated Steel Object.** E. C. Domm, assignor to National-Standard Co., both of Niles, Mich.

2,002,375. **Ornamented Rubber Article.** L. H. L'Hollier, Waltham, assignor to Hood Rubber Co., Inc., Watertown, both in Mass.

2,002,527. **Securing Unvulcanized Rubber to Fabric Uppers.** I. and L. Dorogi, assignors to Magyar Ruggyantaarugyár Részvénytársaság, all of Budapest, Hungary.

2,002,640. **Rubber Thread.** N. G. Madge, Providence, R. I., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,003,191. **Preserving Fruit.** W. J. H. Hinrichs, Hamburg, and H. Wittkowski, Lockstedt-Niendorf, both in Germany.

2,003,192. **Moistureproof and Airtight Coatings.** W. J. H. Hinrichs, Hamburg, and H. Wittkowski, Lockstedt-Niendorf, both in Germany.

2,003,721. **Rubber Thread.** U. Pestalozza, assignor to Soc. Italiana Pirelli, both of Milan, Italy.

2,003,934. **Grease Retaining Washer.** L. H. Hansel, Brookline, assignor to Felters Co., Boston, both in Mass.

2,003,935. **Upholstery Padding.** J. A. Howard, London, England.

2,003,988. **Sheet Material for Curing and Protecting Concrete.** E. H. Angier, Framingham, Mass.

2,004,029. **Latex Impregnating Textiles.** J. E. C. Bongrand, Paris, and L. S. M. Lejeune, Wasquehal, both in France.

2,004,037. **Repairing Casings.** W. H. Criswell, Seattle, Wash.

2,004,079. **Sealed Containers.** C. E. McManus, assignor to Crown Cork & Seal Co., Inc., both of New York, N. Y.

2,004,110. **Porous Rubberized Fabric.** P. H. Head, Attenborough, assignor to Xetal Products, Ltd., Long Eaton, both in England.

2,004,425. **Shoe.** W. H. Bain, Portsmouth, O.

2,004,508. **Printing Roller.** C. Neubert, Giersdorf, Germany.

2,004,652. **Cylinder Packing.** P. W. Dempsey, Pittsburgh, assignor to Westinghouse Air Brake Co., Wilmerding, both in Pa.

Dominion of Canada

350,316. **Brake Lining.** World Bestos Corp., Paterson, assignee of W. Nanfeldt, Clifton, both in N. J., U. S. A.

350,442. **Perforated Rubber Article.** International Latex Processes, Ltd., St.

Peter's Port, Channel Islands, assignee of R. W. Eldridge, Nutley, N. J., U. S. A.

350,443. **Wrinkled-Surface Article.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of A. E. Barnard, Waterbury, Conn., U. S. A.

350,502. **Rubber Coated Paper.** W. H. Shaw, Mimico, and J. J. Moriarty, Toronto, co-inventors, both in Ont.

350,611. **Porous Fibrous Product.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of E. Bitterli, Paris, France, and P. Klein, Budapest, Hungary, co-inventors.

United Kingdom

423,661. **Emery Cloth, Etc.** A. H. Stevens, London. (Minnesota Mining & Mfg. Co., St. Paul, Minn., U. S. A.)

423,923. **Railway Wheel.** M. Kahn, Cologne, Germany.

424,526. **Tire Bead Reenforcement.** Wingfoot Corp., Akron, O., U. S. A.

424,561. **Expanded Fibrous Product.** Rubber Producers Research Assocn., P. Schidrowitz, and C. A. Redfern, all of London.

424,774. **Bookbinding.** A. A. Fortier, Paris, France.

424,871. **Compound Sheet Material.** G. Smith, London.

425,057. **Porous Elastic Fabric.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, and L. Brown, Manchester.

425,079. **Fibrous Sheet Material.** E. V. Hayes-Gratze, London.

425,151. **Treating Paper Webs.** A. H. Stevens, London. (Minnesota Mining & Mfg. Co., St. Paul, Minn., U. S. A.)

425,254. **Rubber-Impregnated Cigarette Tip.** F. Meyer, Rheinpfalz, Germany.

425,297. **Attaching Rubber to Metal.** National-Standard Co., assignee of E. C. Domm, both of Niles, Mich., U. S. A.

425,581. **Prolonging Moist Condition of Concrete.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands.

425,596. **Attaching Rubber to Metal.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

Germany

614,615. **Rubber Thread.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by C. and E. Wiegand, both of Berlin.

614,659. **Stamping Articles from Vulcanized Sheet.** P. Wienskowitz, Berlin.

614,662. **Sewing Sponge Rubber Soles to House Shoes.** Adler & Neumann, Frankfurt a. M.

614,761. **Hose Fabric.** Optimit Gummi- und Textilwerke A. G., Odrau, Czechoslovakia. Represented by A. Kuhn, Berlin.

615,124. **Working up Vulcanized Waste.** C. Muller Gummiwarenfabrik A. G., Berlin-Weissensee.

CHEMICAL

United States

2,001,788. **Aldehyde Product Stabilization.** P. J. Leaper, Naugatuck, Conn., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,001,791. **Treating Latex.** C. E. Linscott, Saugus, Mass., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,002,067. **Cold Vulcanization.** D. F. Twiss, Wylde Green, A. E. T. Neale, Ward End, and J. A. Wilson, Erdington, all in England, assignors to Dunlop Tire & Rubber Corp., Buffalo, N. Y.

2,002,174. **Colored Rubber Product.** H. Eichwede, Frankfurt a. M.-Hochst, Germany, assignor to General Aniline Works, Inc., New York, N. Y.

2,002,613. **Synthetic Wax.** L. Orthner, Leverkusen I. G. Werk, and H. Keppler, Leverkusen-Schlebusch, both in Germany, assignors to General Aniline Works, Inc., New York, N. Y.

2,002,622. **Latex Stabilizer.** I. Williams, Woodstown, N. J., and B. Dales, Chadds Ford, Pa., assignors to E. I. du Pont de Nemours & Co., Wilmington, Del.

2,002,639. **Accelerator.** H. A. Lubs, Wilmington, Del., and I. Williams, Woodstown, N. J., assignors to E. I. du Pont de Nemours & Co., Wilmington, Del.

2,002,642. **Accelerator.** L. Meuser and P. J. Leaper, both of Naugatuck, Conn., assignors, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,003,112. **Tire Sealing Compound.** H. French and W. F. Welbeloved, assignors to C. W. Chant, all of Toronto, Ont., Canada.

2,003,703. **Accelerator.** D. F. Twiss, Sutton Coldfield, and F. A. Jones, Birmingham, both in England, assignors to Dunlop Tire & Rubber Corp., Buffalo, N. Y.

2,004,059. **Shoe Repair Material.** R. R. Bollman, Mt. Washington, and C. L. Ornes, Cincinnati, assignors to Perfect Mfg. Co., Cincinnati, all in O.

2,004,156. **Latex Preservation.** W. E. Cake, Boenet, Asahan, Sumatra, assignor to General Rubber Co., New York, N. Y.

2,004,728. **Accelerator.** K. W. Palmer, Manchester, England, assignor to Imperial Chemical Industries, Ltd.

2,004,914. **Accelerator.** W. D. Wolfe, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

Dominion of Canada

350,568. **Peroxide Resistant Rubber.** Canadian Industries, Ltd., Montreal, P. Q., assignee of J. S. Reichert, Niagara Falls, N. Y., U. S. A.

350,612. **Road Material, Etc.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of D. F. Twiss and E. W. B. Owen, co-inventors, both of Birmingham, England.

United Kingdom

424,251. **Resistance Material.** International General Electric Co., Inc., New York, N. Y., U. S. A., assignee of Allgemeine Elektricitäts-Ges., Berlin, Germany.

424,461. **Age Resister.** B. F. Goodrich Co., New York, N. Y., U. S. A., assignee of W. L. Semon.

424,493. **Emulsions.** R. Botson, Auderghem, Belgium.

424,701. **Fibrous Composition.** N. L. Dolbey, Armley.

424,776. **Conductor Insulation Compound.** Allgemeine Elektricitäts-Ges., Berlin, Germany.

424,819. **Resin.** Electrical Research Products, Inc., New York, N. Y., assignee of J. H. Ingmanson, Rahway, N. J., and G. S. Mueller, Richmond Hill, N. Y., all in the U. S. A.

424,976. **Oilproofing.** J. Halden & Co., Ltd., and J. Holden, both of Reddish.

425,030. **Photographic Sensitive Material.** J. Halden & Co., Ltd., and J. Holden, both of Reddish.

425,042. **Coloring Rubber.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.

425,049. **Insulation.** W. G. Dewsbury and A. Davies, both of London.

425,159. **Fabric Coating Composition.** A. H. Stevens, London. (Minnesota Mining & Mfg. Co., St. Paul, Minn., U. S. A.)

425,165 and 425,166. **Accelerator.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.

425,192. **Accelerator.** Naamlooze Vennootschap De Bataafsche Petroleum Maatschappij, The Hague, Holland, assignee of H. P. A. Groll, Emeryville, Calif., U. S. A.

425,226. **Coloring Rubber.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.

425,343. **Adhesive Tape.** A. H. Stevens, London. (Minnesota Mining & Mfg. Co., St. Paul, Minn., U. S. A.)

425,486. **Accelerator.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)

425,699. **Cork-Rubber Composition.** Marbolith Flooring Co., Ltd., and W. H. Stevens, both of London.

Germany

615,050. **Conversion Products of Rubber.** I. G. Farbenindustrie A. G., Frankfurt a. M.

615,100. **Stabilizing Chlorinated Rubber.** Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt a. M.

GENERAL

United States

2,001,821. **Shoe.** J. H. Everston, Milwaukee, Wis.

2,001,822. **Toy Washing Machine.** F. J. Goriup, McKees Rocks, assignor to Wolverine Supply & Mfg. Co., Pittsburgh, both in Pa.

2,001,841. **Shoe with Elastic Rubber Insert.** I. Goth, Berlin, Germany.

2,001,842. **Teething and Feeding Nipple.** A. C. Heise and M. W. Jacobi, both of Baltimore, Md.

2,001,855. **Rubber Spring.** A. Spencer, London, England.

2,001,862. **Facial Tissue Support.** E. C. Battey, New York, N. Y.

2,001,863. **Automobile Door.** C. E. Bedaux, Monts, France.

2,001,871. **Massaging Device.** C. H. Foster, S. Euclid, O.

2,001,901. **Sewer Drain Odor-Sealing Valve.** B. A. Cunningham, Akron, O.

2,001,911. **Abrasive Article.** C. E. Wooddell and C. S. Nelson, both of Niagara Falls, and R. Lincoln, Buffalo, assignors to Carborundum Co., Niagara Falls, all in N. Y.

2,001,968. **Tire Cover.** G. A. Lyon, Allenhurst, assignor to Lyon, Inc., Asbury Park, both in N. J.

2,001,990. **Attachment Plug Receptacle.** W. C. Tregoning, Wauwatosa, assignor to Cutler-Hammer, Inc., Milwaukee, both in Wis.

2,002,001. **Clothes Hanger.** E. C. Beard, assignor of ½ to A. M. Beard, both of Mishawaka, Ind.

2,002,032. **Printing Press Inking Mechanism.** A. and E. Kluge, assignors to

Brandtjen & Kluge, Inc., all of St. Paul, Minn.

2,002,064. **Artificial Limb Socket.** T. Konl, Wilkes-Barre, Pa.

2,002,144. **Applicator.** W. O. Heaton, Oakland, Calif.

2,002,252. **Freezing Tray.** R. H. Chilton, Dayton, O., assignor, by mesne assignments, to General Motors Corp., Detroit, Mich.

2,002,267. **Storage Battery.** G. L. Kyle, assignor to U S L Battery Corp., both of Niagara Falls, N. Y.

2,002,269. **Motor Mounting.** R. K. Lee, Highland Park, assignor to Chrysler Corp., Detroit, both in Mich.

2,002,270. **Valve Mechanism.** F. A. Lind, assignor to Chrysler Corp., both of Detroit, Mich.

2,002,291. **Connecter Element.** E. R. Kulka, assignor to C. D. Wood Electric Co., Inc., New York, N. Y.

2,002,302. **Electric Connecter Plug.** H. L. Strongson, New York, N. Y., assignor to Beaver Mfg. Co., Newark, N. J.

2,002,368. **Diaper Pad.** C. L. Fancher, Cleveland, O.

2,002,377. **Resilicnt Connecter.** R. Mayne, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,002,449. **Dermatoid Mask.** E. Dohm, assignor of ½ to F. R. Seyfried, both of Toledo, O.

2,002,461. **Cable Insulation.** R. R. Williams, Roselle, and A. R. Kemp, E. Orange, both in N. J., assignors to Western Electric Co., Inc., New York N. Y.

2,002,535. **Handle Grip.** G. E. Gagnier, Detroit, Mich.

2,002,577. **Pipe Line Repair Device.** H. H. Ice, Muskogee, Okla.

2,002,592. **Dispensing Device.** J. Stremel, assignor of ⅔ to N. Stremel and ⅓ to G. E. Syp, all of Spokane, Wash.

2,002,598. **Liquid Applicator.** A. H. Wood, Jr., Winchester, assignor to C. M. Kimball Co., Everett, both in Mass.

2,002,599. **Dredge Hoister.** J. M. Bennett, Joliet, Ill.

2,002,650. **Shoe Sole Cementer.** K. L. Venters, Eugene, Ore.

2,002,677. **Container Drip Catcher.** R. Robinson, Portland, Ore.

2,002,700. **Shock Absorber.** L. L. Lomar, Houston, Tex.

2,002,722. **Frost Shield.** J. R. Thorp, assignor to Fulton Co., both of W. Allis, Wis.

2,002,726. **Golf Ball.** L. A. Young, Detroit, Mich.

2,002,739. **Extensible Electric Conductor.** K. Herkenberg, Oberbarmen-Heckinghausen, Germany.

2,002,750. **Jig Saw Puzzle.** M. E. Noble, Berkeley, Calif.

2,002,756. **Marker.** G. Segelhorst, Stowe, O.

2,002,779. **Connecter Cap.** F. C. Kollath, Chicago, Ill., assignor, by mesne assignments, to Cutler-Hammer, Inc., Milwaukee, Wis.

2,002,784. **Spare Tire Cover.** G. A. Lyon, Allenhurst, assignor to Lyon, Inc., Asbury Park, both in N. J.

2,002,825. **Tie.** M. H. McWhirter, assignor of ½ to E. G. Stafford, both of McCamey, Tex.

2,002,835. **Siphon Device.** W. H. Rose, Jersey City, N. J.

2,002,881. **Track.** E. Bretschneider, Dresden, Germany.

2,002,897. **Belt Connecter.** E. H. Kremer, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

2,002,931. **Colostomy Belt.** M. A. Bowman, Rochester, Minn.

2,003,028. **Windshield Heater.** L. Zaiger, Lynn, Mass.

2,003,045. **Automobile Water Heater.** R. H. Griffiths, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,003,101. **Flower Holder.** A. W. Asman, Lombard, Ill.

2,003,120. **Journal Box Oil Seal and Dust Guard.** W. B. D. Penniman, Lawyer's Hill, Md.

2,003,133, 2,003,134, and 2,003,135. **Bottle Crate.** H. V. Bowman, Minneapolis, assignor to Bowman Products, Inc., St. Paul, both in Minn.

2,003,343. **License Plate Holder.** C. R. Davis, assignor to Davis Tool & Engineering Co., both of Detroit, Mich.

2,003,367. **Headgear.** H. Julich, New Rochelle, N. Y.

2,003,511. **Vehicle Shock Absorber.** J. Mercier, Neuilly-sur-Seine, France.

2,003,514. **Grip Strap.** H. H. Rubin, New York, N. Y.

2,003,586. **Milking Machine Connecter.** S. J. Erling, Nockeby, Sweden, assignor to De Laval Separator Co., New York, N. Y.

2,003,646. **Foot Aerating Device.** M. De Blasio, Wilkes-Barre, Pa.

2,003,726. **Refrigerator Sealing Strip.** R. S. Taylor, Evansville, Ind., assignor to Electrolux Servel Corp., New York, N. Y.

2,003,750. **Suspender End Assemblage.** L. W. Joyce, assignor to Southern Webbing Mills, Inc., both of Greensboro, N. C.

2,003,772. **Insulated Conductor.** A. N. Gray, Baltimore, Md., assignor to Bell Telephone Laboratories, Inc., New York, N. Y.

2,003,779. **Mining System and Apparatus.** G. A. Yedd, assignor of ½ to J. R. Pusey, both of Oakland, Calif.

2,003,792. **Plug Fuse with Replaceable Fuse Link.** J. Rosenbaum, W. Orange, N. J.

2,003,891. **Dental Plate.** E. Kaczmarek, Berlin-Hermsdorf, Germany.

2,003,917. **Handle Grip.** J. G. Bowden, Millbury, assignor to Felters Co., Boston, both in Mass.

2,003,920. **Bathing Cap.** W. Carter, Wallington, assignor of ½ to George Spencer Moulton & Co., Ltd., London, both in England.

2,003,942. **Fabric Gripper.** J. D. Karle, Roselle Park, assignor to Singer Mfg. Co., Elizabeth, both in N. J.

2,003,955. **Hat.** R. K. Reynolds, assignor to Mallory Hat Co., both of Danbury, Conn.

2,003,957. **Jingle Ball.** M. B. Salisbury, Chicago, Ill.

2,003,958. **Imitation Bone.** M. B. Salisbury, Chicago, Ill.

2,003,983. **Wrench.** A. F. Thener, assignor to Cupples Co., both of St. Louis, Mo.

2,003,990. **Cable.** G. Carlson, Bridgeport, and H. G. Knoderer, Fairfield, both in Conn., assignors to General Electric Co., a corporation of N. Y.

2,003,991. **Weatherproof Armored Cable.** G. Carlson, Bridgeport, Conn., assignor to General Electric Co., a corporation of N. Y.

2,004,004. **Weatherproof Armored Cable.** H. G. Knoderer, Fairfield, Conn., assignor to General Electric Co., a corporation of N. Y.

2,004,036. **Antiskid Tire.** E. Coenning, Halensee, Germany.

2,004,088. **Holder.** B. S. Alsop, Scarsdale, N. Y.

2,004,151. **Heater.** R. W. Angstman, Pontiac, Mich., assignor, by mesne assignments, to E. A. Laboratories, Inc., Brooklyn, N. Y.

2,004,167. **Golf Ball.** N. G. Madge, Montclair, N. J., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,004,265. **Flexible Rattle Handle.** A. Zadek and I. E. Cohn, both of New York, N. Y.

2,004,299. **Universal Joint.** J. R. Snyder, Pittsburgh, Pa.

2,004,304. **Storage Battery Separator.** L. E. Wells, Cleveland Heights, assignor to Willard Storage Battery Co., Cleveland, both in O.

2,004,382. **Work Glove.** R. C. Palicki, Toledo, O.

2,004,411. **Aircraft.** H. F. Krug, Grosse Pointe Park, Mich.

2,004,413. **Weather Strip.** D. T. Main, Westmount, P. Q., assignor to Best Weather Strip Co., Ltd., Hamilton, Ont., both in Canada.

2,004,479. **Transmission Belt.** A. B. Merrill, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,004,481. **Garment Supporter.** A. Simpson, London, England.

2,004,485. **Jar Tool.** P. R. Brause, W. Union, Iowa.

2,004,490. **Neckwear.** A. T. Lapham, London, England.

2,004,506. **Shaft Journal and Bearing.** L. Q. Moffitt, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,004,519. **Ice Tray.** R. H. Chilton, Dayton, O., assignor to General Motors Corp., Detroit, Mich.

2,004,525. **Freezing Tray.** H. D. Geyer and F. W. Sampson, both of Dayton, O., assignors by mesne assignments, to General Motors Corp., Detroit, Mich.

2,004,531. **Repeating Toy Gun.** G. H. Leonard, Detroit, Mich.

2,004,532. **Resilient Mounting.** C. W. Mapes, Dayton, O., assignor, by mesne assignments, to General Motors Corp., Detroit, Mich.

2,004,541. **Sole Cementing Press.** J. L. Thompson, Somerville, assignor of ½ to G. Laganas, Lowell, and ½ to L. A. Wilson, Somerville, all in Mass.

2,004,573. **Pea Sheller.** J. A. Galley, Edgecliff, and E. V. Galley, Milsons Point, both in N. S. W., Australia.

2,004,576. **Applicator Roll.** J. Kirsch, Milwaukee, Wis.

2,004,589. **Electrical Conductor.** A. B. Smedley, Flushing, assignor to Anaconda Wire & Cable Co., New York, both in N. Y.

2,004,592. **Electrical Conductor Cable.** J. L. Alden, La Grange, Ill., assignor to Western Electric Co., Inc., New York, N. Y.

2,004,610. **Electrical Apparatus Mounting.** F. H. Jones, Summit, N. J., assignor to Bell Telephone Laboratories, Inc., New York, N. Y.

2,004,618. **Stuffing Machine Press-Head.** O. C. Schmidt, assignor to Cincinnati Butchers' Supply Co., both of Cincinnati, O.

2,004,641. **Fountain Pen.** R. B. Watson, Colorado Springs, Colo.

2,004,684. **Swimming Glove.** E. B. Bell, Brooklyn, N. Y.

2,004,702. **Elastic Shoe Lace.** F. Luttmann, Jr., Chicago, Ill.

2,004,712. **Elastic Shaft Coupling.** L. Thiry, Huy, Belgium.

2,004,722. **Weather Strip.** W. S. Hamm, Elkhart, Ind., assignor to Adlake Co., Chicago, Ill.

2,004,723. **Flooring.** H. C. Harvey, Trenton, N. J.

2,004,730. **Girdle.** H. V. Reidenbach, Richmond Hill, N. Y.
2,004,765. **Firemen's Waterproof Suit.** F. G. Molter, Hempstead, N. Y.
2,004,766. **Tie Lining.** B. R. Nyhagen, Bronx, N. Y.
2,004,817. **Toy.** A. T. Linney, Lexington, Ky.
2,004,820. **Shoe Presser.** R. F. McClenathan, assignor to Lamac Process Co., both of Erie, Pa.
2,004,822. **Tire Pressure Control.** L. M. Mercier, Neuilly-sur-Seine, France.
2,004,854. **Foundation Garment.** K. E. Cunningham, assignor to I. Newman & Sons, Inc., both of New Haven, Conn.
2,004,892. **Pneumatic Tire.** W. A. Grieshaber, Riverside, Calif.
2,004,897. **Shoe.** J. A. Lussier, assignor to Hood Rubber Co., Inc., both of Watertown, Mass.
2,004,901. **Electrical Conductor.** D. R. G. Palmer, S. Orange, N. J., assignor to General Cable Corp., New York, N. Y.
2,004,906. **Pneumatic Shoe.** L. W. Simister, assignor of ½ to J. Farese, both of New York, N. Y.

Dominion of Canada

350,229. **Battery Watering Device.** E. P. M. Nieman, Three Hills, Alta.
350,237. **Shoe Part Surface Protection.** Boston Blacking Co. of Canada, Ltd., Montreal, P. Q., assignee of W. H. Wedger, Belmont, Mass., U. S. A.
350,258. **Milking Apparatus.** De Laval Separator Co., New York, N. Y., assignee of C. H. Hapgood, Nutley, N. J., both in the U. S. A.
350,295. **Wiper Blade.** Trico Products Corp., assignee of W. Paulus, both of Buffalo, N. Y., U. S. A.
350,319. **Knee Rest.** G. W. Hoover, co-inventor with and assignee of L. L. Wood, both of Washington, D. C., U. S. A.
350,340. **Shoe.** J. H. Everston, Milwaukee, Wis., U. S. A.
350,341. **Book Cover.** A. A. Fortier, Paris, France.
350,346. **Fountain Pen.** H. McL. Hutchison, Edmonton, Alta.
350,451. **Pipe Joint.** Lock Joint Pipe Co., E. Orange, assignee of W. W. Trickey, Verona, both in N. J., U. S. A.
350,491. **Powder Box.** J. F. Baker, Dobbs Ferry, assignee of W. J. Bauer, New York, both in N. Y., U. S. A.
350,536. **Golf Ball.** L. A. Young, Detroit, Mich., U. S. A.
350,584. **Container Closure.** Carbide & Carbon Chemicals Corp., New York, N. Y., assignee of J. P. Trickey, Cleveland, O., and J. R. Price, Chicago, Ill., co-inventors, all in the U. S. A.
350,591. **Tulle and Lace.** Dognin-Société Anonyme, Villeurbanne, assignee of A. Isaac, Lyon, both in France.
350,615. **Sleeping Garment.** Lutfy Whitewear Mfg. Co., assignee of J. G. Lutfy, both of Montreal, P. Q.
350,642. **Windshield Wiper.** D. Gentile, Towaco, inventor, and J. Wanderman, Boonton, assignee of ½ of the interest, both in N. J., U. S. A.
350,687. **Air Cushioned Heel.** C. Stevenson, New York, N. Y., U. S. A.
350,722. **Spring System.** Federal Spring Co., Coraopolis, Pa., assignee of E. F. Zaparka, Baltimore, Md., both in the U. S. A.
350,723 and 350,724. **Heel Lift.** Fitz-On Sales Corp., assignee of J. V. Critchley, both of Worcester, Mass., U. S. A.
350,758. **Storage Battery Separator.** Jos. Stokes Rubber Co., Ltd., Welland, Ont., assignee of Jos. Stokes Rubber Co., assignee of M. H. Martindell, Trenton, N. J., U. S. A.
350,759. **Bottle Stopper.** Sun Rubber Co., assignee of M. S. Lower, both of Barberton, O., U. S. A.

United Kingdom

423,067. **Life Saver.** A. E. Biecoe and S. G. Stanford, both of London.
423,113. **Lay Figure.** F. C. Lawrence, London.
423,216. **Hat Peg.** A. Noble, Halifax, and T. P. Walkland, Morecambe.
423,243. **Ordnance Field Carriage.** Martin-Parry Corp., York, Pa., U. S. A.
423,623. **Teapot Cover.** J. Dessar, London.
423,631. **Egg Cleaner.** A. Davidson, Kelso.
423,679. **Squeegee.** J. S. Wheelwright, Tonbridge.
423,695. **Conductor.** Norddeutsche Seekabelwerke A. G., Oldenburg, Germany.
423,733. **Vacuum Cleaner.** Electrolux, Ltd., Luton, assignee of Inventia Patent-Verwertungs Ges., Schaffhausen, Switzerland.
423,755. **Pipe Cleaner.** Haskins Patent Pipe Linings, Ltd., Sydney, assignee of G. Haskins, Wahroonga, and S. T. Farnsworth, Vaucluse, all in Australia.
423,845. **Typewriter.** A. F. Burgess, London. (L. C. Smith & Corona Typewriters, Inc., Syracuse, N. Y., U. S. A.)
423,882. **Canned Food Cooker.** J. Laing, Welwyn Garden City.
423,943. **Windscreen Dimming Preventive.** F. W. Covington, Chelmsford.
423,966. **Spring.** A. Spencer and G. Spencer Moulton & Co., Ltd., both of Westminster.
423,982. **Tie.** S. N. Lane, Dublin, Ireland.
424,027. **Duplicator.** Ditto, Inc., Chicago, Ill., U. S. A.
424,028. **Boot.** J. F. Gilkerson, Milwaukee, Wis., U. S. A.
424,033. **Boot Upper Protector.** L. Andrews and Gutta Percha & Rubber (London), Ltd., both of London.
424,052. **Draught Excluder.** F. Smith, Camberley.
424,058. **Land and Water Vehicle.** A. E. Taylor, Levencorrach, Isle of Arran.
424,059. **Vehicle Spring Suspension.** A. E. Taylor, Levencorrach, Isle of Arran.
424,060. **Beer Cooler and Heater.** T. S. S. and F. L. S. Murray, both of London.
424,069. **Pencil Holder.** Conway Stewart & Co., Ltd., and J. Jeff, both of London.
424,072. **Printing Plate.** Econo Products, Inc., Rochester, N. Y., U. S. A., assignee of S. C. Wilson.
424,090. **Loom Shuttle.** Soc. Internationale De Fils Elastiques and M. L. M. Pinget, both of Paris, France.
424,099. **Bathtub.** G. H. Ellis, Worthing.
424,122. **Vehicle Window.** Ternstedt Mfg. Co., Detroit, Mich., U. S. A., assignee of E. G. Simpson and A. J. Fisher.
424,123. **Toy Speedboat.** Paton, Calvert & Co., Ltd., and A. L. Maclean, both of Liverpool.
424,143. **Abdominal Belt.** Domen Belts Co., Ltd., and D. I. Bernard, both of London.
424,155. **Vehicle Window.** Ternstedt Mfg. Co., assignee of H. C. Field and E. G. Simpson, all of Detroit, Mich., U. S. A.
424,161. **Hand Stamp.** E. Hoffmann, Leipzig, Germany.
424,167. **Vehicle Spring Suspension.** Soc. Anon. A. Saurer, Arbon, Switzerland.
424,171. **Bracket.** G. H. R. Batchelor, London. (Compagnie Francaise du Mono Service, Roubaix, France.)
424,173. **Polishing Pad.** T. W. Eley, Chadwell Heath.
424,193. **Brake.** Hydraulic Brake Co., Detroit, Mich., U. S. A.
424,194. **Escalator.** W. S. Graff-Baker, Higher Denham.
424,206. **Drip Catcher.** A. Ibison, Wallasey.
424,215. **Switchboard.** W. G. W. Shaw, Liverpool.

Germany

614,574. **Tire.** G. Kiewitt, Hamburg.
614,678. **Rubber Preservative.** I. Rabinowitz, Tel-Aviv, Palestine. Represented by G. Zeidler, Berlin-Wilmersdorf.
614,988. **Dress Shield.** Julius Friedlaender Gummiwaren-Fabrik, G. m. b. H., Berlin.
615,104. **Block Belt.** H. Scherrer, Bern, Switzerland. Represented by B. Oettinger, Berlin.
615,339. **Driving Belt.** R. Chavand, Lyon, France. Represented by W. Massohn, Berlin.
615,351. **Rubber Skid Chain.** F. Hetz, Karlsruhe i. B.

TRADE MARKS

United States

324,425. **Flexifoil.** Gaskets. Victor Mfg. & Gasket Co., Chicago, Ill.
324,484. **Super Allstate.** Tires. Sears, Roebuck & Co., Chicago, Ill.
324,502. **Mar-V-Lus.** Prophylactic rubber articles. W. H. Reed, doing business as W. H. Reed & Co., Atlanta, Ga.
324,588. **Dual Royal.** Inner tubes. United States Rubber Co., New York, N. Y.
324,688. **Koh-I-Noor.** Erasers. Koh-I-Noor Bleistiftfabrik L. & C. Hardtmuth, Budweis, Czechoslovakia.
324,692. **-2- Life.** Heels. Auburn Rubber Corp., Auburn, Ind.
324,766. **Fashion Hour Stout Eze.** Foundation garments. Blair Corset Co., Inc., Chicago, Ill.
324,779. **Rubberlike.** Floor covering. Bird & Son, Inc., E. Walpole, Mass.
324,859. Representation of a Roman soldier. Absorbent cotton, gauze bandages, adhesive plaster and tape. Forest City Rubber Co., Cleveland, O.
324,877. Label containing the word: **"Carlisle."** Inner tubes. Carlisle Tire & Rubber Co., Carlisle, Pa.
324,970. **J. E. Grosjean. Rocker Sole.** Soles. Lima Cord Sole & Heel Co., Lima, O.
325,013. **Cushion-Tred.** Rugs and carpets. Bigelow-Sanford Carpet Co., Inc., Thompsonville, Conn.
325,143. **Poinsettia.** Household or industrial gloves. Wilson Rubber Co., Canton, O.
325,177. **Bevel Weld.** Inner tubes. Lee Rubber & Tire Corp., Conshohocken, Pa.

Market Reviews

CRUDE RUBBER

New York Quotations

New York outside market rubber quotations in cents per pound

Plantations	July 25, 1934	June 25, 1935	July 27, 1935
Rubber latex, normal .....gal.	60	51	48
Sheet			
Ribbed, smoked spot 14½/14⅝		12⅝/12¹¹/₁₆	11¾
Aug.-Sept 14¾		12¾/12¹⁵/₁₆	11¹⁵/₁₆/11⅞
Oct.-Dec. 15		12⅞/12¹⁵/₁₆	11¹⁵/₁₆/12
Jan.-Mar. 15⅜		13 /13¹/₁₆	12⅛/12⅜
Crepe			
No. 1 thin latex, spot 16¼/16⅜		12⅞/13	12
Aug.-Sept. 16½		13 /13⅛	12¹/₁₆/12⅛
Oct.-Dec. 16¾		13⅛/13⅜	12⅜/12¼
Jan.-Mar. 17⅛		13¼/13½	12⅜/12⅝
No. 3 Amber, spot	12 /12⅛	11⅞	11⅛/11⅜
No. 1 Brown 12⅛/12¼		12	11¼/11½
Brown rolled 9⅛/ 9¼		10¾/11	10⅛/10¼
Paras			
Upriver fine	11	9⅝	9¾
Upriver fine	*14½	*12⅝	*12¾
Upriver coarse...	..	7½	..
Upriver coarse...	*12	*11	*11¼
Islands fine	..	10½	11¼
Islands fine	..	*12½	..
Acre, Bolivian fine	12	9¾	10
Acre, Bolivian fine	*15	*13	*12½
Beni, Bolivian ...	11½	10	10¼
Madeira fine	..	9⅝	10
Caucho			
Upper ball	7½	7½	..
Upper ball	*10¼	*11	*11¼
Lower ball	7	7	..
Pontianak			
Bandjermasin	6	6	6½
Pressed block ...	12	11½	9½/11
Sarawak	6	6	6½
Guayule			
Duro, washed and dried	12	12	12
Ampar	13	13	13
Africans			
Rio Nuñez	10	..	12
Black Kassai	9¾	..	10
Prime Niger flake.	16	..	25
Gutta Percha			
Gutta Siak	9½	11	10¾/11
Gutta Soh	14½	13	13 /13½
Red Macassar ...	1.50	1.30	1.25
Balata			
Block, Ciudad ... Bolivar	52	30	30
Manaos block	52	27	26
Surinam sheets ..	47	36	35
Amber	52	38	38

*Washed and dried crepe. Shipments from Brazil.

Commodity Exchange

TABULATED WEEK-END CLOSING PRICES

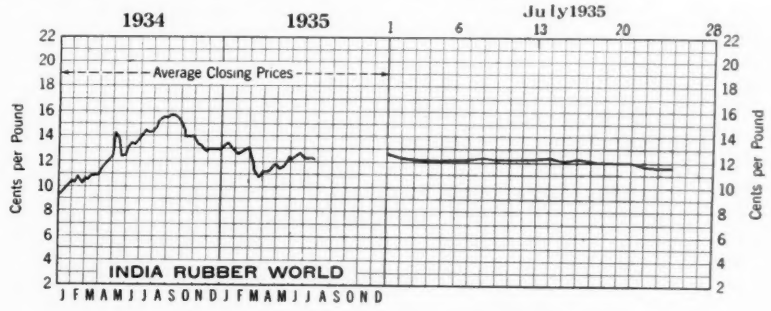
Futures	June 1	June 29	July 6	July 13	July 20
June	12.13	.....	.....	.....	.....
July	12.23	12.48	12.16	12.13	11.95
Aug.	.....	12.53	12.23	12.19	12.00
Sept.	12.34	12.58	12.30	12.25	12.05
Dec.	12.55	12.80	12.44	12.49	12.27
Mar.	12.78	13.02	12.66	12.69	12.50
June	.....	.....	12.96	12.87	12.68
Volume for week (tons).	16,840	19,600	3,530	5,860	6,800

THE above table gives the nearest first and last week-end closing prices of the month previous to that just closed, also the week-end closing prices of each week of last month up to the time of going to press. This plan sets forth the general price trends in the briefest manner possible. Further, for the convenience of the reader the plan of the text matter of this review is changed to cover only those occurrences which are of possible significance to major price changes and general price trends, thus eliminating any attempt to record the numerous and historically unimportant daily fluctuations.

June ended with price levels 37 to 41 points below the highs reached during the week of June 15. The net change for the month was 24 to 25 points' improvement from the NRA annulment reaction lows that prevailed June 1.

Trading during July was marked by vacation season dullness and lack of activity. The first three weeks' total volume was 16,190 tons, equaling the trading of a very nominal week. News developments were likewise relatively inconsequential. Prices followed a course of alternating advances and declines of narrow range, the latter, however, prevailing sufficiently to recede prices 55 to 58 points during the first 3½ weeks. Many factories were closed during the week of July 4 for inventory and vacation purposes.

Automobile manufacturers furnish encouragement to the tire concerns by reporting a continued steady demand for new cars. May developed car registrations of 293,201, 34% above those of May, 1934. An optimistic view is taken by A. L. Mathewson, chairman of Allied Sumatra Plantations, Ltd., according to *The Journal of Commerce*. He points out that the use of motor vehicles is rapidly expanding throughout the world and that registrations in 1934 totaled about 35,000,000 cars, an increase of nearly 2,000,000 over the previous year. On the basis of expanding automobile production this year, Mr. Mathewson predicts a larger consumption of rubber than in 1934.



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

New York Outside Market—Spot Closing Rubber Prices—Cents per Pound

	June, 1935						July, 1935																
	24	25	26	27	28	29*	1	2	3	4†	5	6*	8	9	10	11	12	13*	15	16	17	18	19	20*
No. 1 Ribbed Smoked Sheet	12½	12⅜	12¼	12¼	12½	..	12⅞	12⅝	12¼	..	12⅛	..	12⅛	12⅛	12¼	12⅛	12⅛	..	12⅛	12⅛	12⅛	12⅛	12	..
No. 2 Ribbed Smoked Sheet	12⅛	12⅛	11⅞	11⅞	12⅛	..	12⅛	12	11⅞	..	11⅞	..	11⅞	12	11⅞	11⅞	11⅞	..	12	11¾	11⅞	11¾	11⅞	..
No. 3 Ribbed Smoked Sheet	12⅛	11⅞	11⅞	11⅞	12	..	12	11⅞	11⅞	..	11¾	..	11¾	11⅞	11⅞	11¾	11¾	..	11⅞	11⅝	11¾	11⅝	11⅞	..
No. 4 Ribbed Smoked Sheet	11⅞	11⅞	11⅞	11⅞	11⅞	..	11⅞	11¾	11⅞	..	11⅝	..	11⅝	11¾	11¾	11⅞	11⅞	..	11¾	11½	11⅞	11⅞	11½	..
No. 1 Thin Latex Crepe...	12¼	12⅝	12½	12½	12¾	..	12¾	12⅝	12½	..	12⅜	..	12⅞	12⅞	12½	12⅜	12⅜	..	12½	12⅞	12⅜	12¼	12⅞	..
No. 1 Thick Latex Crepe.	12⅝	12½	12⅜	12⅜	12⅝	..	12⅝	12½	12⅜	..	12¼	..	12⅞	12⅞	12⅜	12¼	12¼	..	12⅜	12⅞	12¼	12⅜	12⅞	..
No. 1 Brown Crepe....	12	11⅞	11¾	11¾	12	..	11⅞	11⅞	11¾	..	11⅝	..	11⅞	11⅞	11¾	11⅞	11⅞	..	11¾	11⅝	11¾	11⅝	11⅞	..
No. 2 Brown Crepe....	11⅞	11¾	11⅝	11⅝	11⅞	..	11¾	11⅞	11⅝	..	11½	..	11⅞	11⅞	11⅝	11⅞	11⅞	..	11⅝	11½	11⅝	11½	11⅞	..
No. 2 Amber	12	11⅞	11¾	11¾	12	..	11⅞	11⅞	11¾	..	11⅝	..	11⅞	11⅞	11¾	11⅞	11⅞	..	11¾	11⅝	11¾	11⅝	11⅞	..
No. 3 Amber	11⅞	11¾	11⅝	11⅝	11⅞	..	11¾	11⅞	11⅝	..	11½	..	11⅞	11⅞	11⅝	11⅞	11⅞	..	11⅝	11½	11⅝	11½	11⅞	..
No. 4 Amber	11½	11¾	11½	11¼	11¾	..	11¼	11¾	11¾	..	11¼	..	11¾	11⅞	11¾	11⅞	11⅞	..	11¾	11¼	11¾	11¼	11⅞	..
Rolled Brown	10¾	10¾	10⅝	10⅝	10⅞	..	10¾	10⅞	10⅝	..	10½	..	10⅝	10¾	10¾	10⅞	10⅞	..	10¾	10⅝	10⅝	10½	10⅞	..

*Closed. †Holiday.

Part of the R.M.A. statistics for June were not particularly encouraging. Consumption in the United States amounted to 36,623 long tons, against 41,568 long tons for May, 1935, a decrease of 11.9% below May and 8.9% under June, 1934. Imports for June were 38,340 long tons, 42.7% above May and 22.8% under June, 1934. This association estimates total domestic stocks of crude rubber on hand June 30 at 320,470 long tons, compared with May 31 stocks of 319,281 long tons and 358,461 long tons on hand June 30, 1934. The production of pneumatic casings for May was 4,175,170, a decrease of 7.5% below April and 6.3% under May, 1934.

The Journal of Commerce reports that world stocks of crude rubber amounted to 672,902 tons at the end of May, according to a survey of Commodity Exchange, Inc. This was 10,181 tons less than at the end of April, but 3,066 tons more than a year earlier. During May a reduction in stocks in the United States was more than offset by increases in the United Kingdom and Malaya. 65% basic quotas became effective July 1, for shipments of rubber from all producing countries.

New York Outside Market

The price of No. 1 smoked sheets gained 1/8¢ net during June although it reached within 1/8¢ of the 13¢ level about the middle of that month. Fluctuations during July were relatively narrow, but with a downward trend. The week-end prices during June and July follow: June 1, 12 7/8¢; June 8, 12 13/16¢; June 15, 12 3/4¢; June 22, 12 5/8¢; June 29, 12 1/2¢; July 6, 12 5/8¢; July 13, 12 7/8¢; and July 20, 12¢. Factory demand furnished practically the only influence of price and trend, and this was with unimportant exceptions of the expected seasonal dullness.

Accuracy of Rubber Import Statistics

E. G. Holt, assistant chief, Leather and Rubber Division of the Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C., has issued an appeal to importers to list carefully and describe accurately their imports, which will permit issuing statistics of greater dependability to the trade, where it is of more importance than ever before since restriction.

The Special Circular No. 3,577, Rubber Section, entitled "Official Classification of United States Imports of Crude Rubber and Allied Materials" follows:

"The accuracy of statistics officially reported for United States imports of rubber and allied materials depends primarily on the accuracy of import entries filed by importers and their agents. Since such imports enter duty free, tabulations are based on the descriptions, quantities, and values of goods reported on the import entries, and not at all on tariff rates applied by the Customs as in the case of dutiable goods. Considering the desire of the trade for accurate information regarding these imports, perhaps more than ever with the international rubber regulation scheme in effect, there is no good reason why the statistics should not be accurate. Carelessness in describing the commodities imported, or in reporting their quantity or value, would, however, be reflected in improper coding and tabulation.

"In order to assure accuracy of the official statistics, every importer is urged to have import entries executed by competent clerks. The commodity imported should be described in terms easily identifiable under the official classification, so that coding clerks may assign classification numbers without guess-work—for example, the term 'crude rubber' is greatly preferable to 'native blankets' or to 'ribbed smoked sheets,' and the term 'first latex rubber' should be avoided as not clearly indicative to coders whether the commodity is 'latex' or 'dry rubber.'

"Especial care should be taken, in connection with rubber imports, to see that the quantity is accurately reported in terms of *net* weight, in pounds. In particular, importers of latex should report the *net* weight (pounds) of *dry rubber content* for imports classifiable under item 2001.0 in the following schedule.

"In this schedule, items of allied nature are grouped (instead of being arranged numerically) to facilitate its use by importers and their agents. Under each official class title is indicated (where necessary) the nature of the items which should be reported by that class title, for official tabulation purposes. Additional copies of this circular will be cheerfully supplied free."

IMPORT SCHEDULE FOR RUBBER AND ALLIED MATERIALS

Item	Description	Units Reported
2001.0	Rubber, milk of or latex (dry rubber content) Under this item report the *net* weight in pounds of *dry rubber content*, for: ordinary liquid latex, latex concentrates, evaporated or powdered latex, Revertex, etc.	Pounds Value
2007.0	Guayule rubber	Pounds Value
2001.1	Other rubber, crude Under this item report all grades, types, and forms of Hevea, Caucho, and other *natural* rubber whether plantation or wild (except latex, 2001.0; and guayule, 2007.0), *net* weight. Description of the commodity as "crude rubber" will assure accurate classification.	Pounds Value
209.99	Rubber substitutes, advanced *Synthetic* rubber imports are classifiable under this title, under which imports are dutiable (20% ad valorem).	Pounds Value
2010.1	Reclaimed rubber Reclaimed rubber and ground rubber scrap (shoddy) are classifiable under this title, but not hard rubber dust (which is classifiable under item "209.93—other hard rubber manufactures," dutiable at 35% ad valorem).	Pounds Value
2010.2	Scrap rubber Scrap rubber tires, inner tubes, footwear, and waste rubber products of all kinds, or pieces thereof. Description on import entry should read "scrap rubber," and care should be taken to enter low-grade natural rubber as "crude rubber," and not as "scrap rubber" or "rubber scraps."	Pounds Value
2005.0	Balata Covers sheet and block balata, balata gum, perillo gum, and "leche de nispero." Ordinary and refined balata, all grades, not manufactured.	Pounds Value
2006.0	Gutta percha Covers all grades of ordinary and refined gutta percha, not manufactured.	Pounds Value
2004.0	Jelutong or Pontianak Care should be taken not to declare this product as gutta percha.	Pounds Value
2131.0	Chicle, crude Free of duty.	Pounds Value
2189.3	Chicle, refined or advanced Dutiable (5¢ a pound).	Pounds Value

RUBBER SCRAP

THE demand for rubber scrap during July showed no improvement of that during June and was classed as only moderate and seasonal.

BOOTS AND SHOES. All grades of these stocks are rather quiet, but steady and unchanged in price.

INNER TUBES. The demand for tube scrap improved sufficiently to rate as good. Supplies continue ample, and prices steady.

TIRES. Mixed auto tires with beads, also the beadless grade, are quoted 75¢ less per ton than in June. Other grades including solids are steady and unchanged. Prices are, actually, scraping bottom; so collections are poor.

SOLID TIRES. Domestic demand is fair, and export interest is increasing. Stocks are scanty.

MECHANICAL GRADES. All grades are in steady but moderate demand at prices quoted firm and unchanged.

HARD RUBBER. Stocks are scarce, and demand is very active.

CONSUMERS' BUYING PRICES

(Carload Lots Delivered Eastern Mills)

July 27, 1935

		Prices
Boots and Shoes		
Boots and shoes, black	lb.	$0.01 /$0.01 1/4
Colored	lb.	.00 3/4 / .00 7/8
Untrimmed arctics	lb.	.00 3/4 / .00 7/8
Inner Tubes		
No. 1, floating	lb.	.07 1/4 / .07 1/2
No. 2, compound	lb.	.03 1/4 / .03 3/8
Red	lb.	.02 1/2 / .02 5/8
Mixed tubes	lb.	.02 5/8 / .02 3/4
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	ton	7.50 / 8.00
Beadless	ton	11.75 /12.00
Auto tire carcass	ton	9.50 /10.00
Black auto peelings	ton	17.00 /18.00
Solid		
Clean mixed truck	ton	36.00 /37.00
Light gravity	ton	39.00 /40.00
Mechanicals		
Mixed black scrap	ton	15.00 /17.00
Hose, air brake	ton	14.00 /15.00
Garden, rubber covered	ton	13.00 /13.50
Steam and water, soft	ton	13.00 /13.50
No. 1 red	lb.	.02 1/4 / .02 3/8
No. 2 red	lb.	.01 1/2 / .01 3/4
White druggists' sundries	lb.	.02 3/4 / .03
Mechanical	lb.	.02 / .02 1/2
Hard Rubber		
No. 1 hard rubber	lb.	.11 1/8 / .11 1/2

COMPOUNDING INGREDIENTS

ACCELERATORS AND ANTIOXIDANTS. These are meeting with steady seasonal demand, a condition that is expected to continue until autumn.

CARBON BLACK. The outlook for a continuing strong market seems good at present. Production for the first half of 1935 was less than 5% more than in the corresponding months of 1934; while shipments for the same period increased 25%.

LITHARGE. The price advanced to 5.65¢ a pound on July 9, remains unchanged (to July 22). Demand is light.

LITHOPONE. New contracts, effective July 1, were taken at unchanged levels. Demand is slight.

RUBBER COLORS. Business is reported as expanding rapidly without any evidences of price cutting or weakness in the present price structure. Keen interest is developing in specially dispersed colors for rubber work. These offer special advantages in ease of application and finished color cost.

RUBBER SUBSTITUTES. The demand is fairly active, and no price changes have occurred.

SOLVENTS. Demand is steady and seasonal, and prices firm.

STABILIZERS. The demand is conservative at firm prices.

TITANIUM WHITES. There is a seasonal decline in consumption. The recent increase in plant capacity by the inauguration of two new plants bids fair to handle any increased demand for these products in the near future.

ZINC OXIDE. Moderate demand features consumption by the rubber trade. Prices for the second half of the year are the same as in the first half.

New York Quotations

July 27, 1935

Prices Not Reported Will Be Supplied on Application

Abrasives		
Pumicestone, powdered	lb.	$0.01¾/$0.03¼
Rottenstone, domestic	lb.	.02½/ .05
English	ton	
Silica, 15	ton	38.00
Tripoli	lb.	.02¼/ .03
Accelerators, Inorganic		
Lime, hydrated	ton	20.00
Litharge (commercial)	lb.	.06½
Magnesia, calcined, heavy	lb.	.04
carbonate	lb.	.06½
Accelerators, Organic		
A-1	lb.	.21 / .25
A-5-10	lb.	.33 / .36
A-10	lb.	
A-11	lb.	.60 / .75
A-16	lb.	.55 / .65
A-19	lb.	.56 / .75
A-32	lb.	.70 / .80
A-77	lb.	
Accelerator 49	lb.	.40 / .50
85	lb.	
87	lb.	
122	lb.	
552	lb.	
808	lb.	
833	lb.	
Acrim	lb.	
Aldehyde ammonia	lb.	
Altax	lb.	
Beutene	lb.	
Butyl Zimate	lb.	
C-P-B	lb.	
Captax	lb.	
Crylene	lb.	
Paste	lb.	
D-B-A	lb.	
Di-Esterex	lb.	
Di-Esterex-N	lb.	
DOTG	lb.	.44 / .54
D.O.T.T.U.	lb.	
DPG	lb.	.35 / .45
Esterex	lb.	
Ethylideneaniline	lb.	
Formaldehyde P.A.C.	lb.	
Formaldehydeaniline	lb.	
Formaldehyde-para-toluidine	lb.	
Guantal	lb.	.42 / .51
Hepteen	lb.	
Base	lb.	
Hexamethylenetetramine	lb.	
Lead oleate, No. 999	lb.	.11
Witco	lb.	.11
Methylenedianilide	lb.	
Monex	lb.	
Novex	lb.	
Pipsolene	lb.	
R-2	lb.	1.50 / 1.90
Base	lb.	4.55 / 5.00
R & H 50-D	lb.	
Safex	lb.	
Super-sulphur No. 1	lb.	
No. 2	lb.	
Tepidone	lb.	
Tetrone A	lb.	
Thiocarbanilide	lb.	
Thionex	lb.	
Trimene	lb.	
Base	lb.	
Triphenyl guanidine (TPG)	lb.	
Tuads	lbs.	
Ureka	lb.	.62 / 1.00
Blend B	lb.	
C	lb.	.58 / .69
Vulcanex	lb.	
Vulcanol	lb.	
Vulcone	lb.	
Z-B-X	lb.	
Z-88-P	lb.	$0.48 /$0.60
Zenite	lb.	
A	lb.	
B	lb.	
Zimate	lb.	
Acids		
Acetic 28%	100 lbs.	2.45 / 2.70
glacial (carboys)	100 lbs.	14.00
Sulphuric, 66°	100 lbs.	15.50
Activator		
Barak	lb.	
Age Resisters		
Age-Rite Gel	lb.	
HP	lb.	
Powder	lb.	
Resin	lb.	
Syrup	lb.	
White	lb.	
Akroflex A	lb.	
B	lb.	
C	lb.	
Albasan	lb.	
Antox	lb.	
A-V-A-R	lb.	
B-L-E	lb.	
Flectol B	lb.	
H	lb.	
White	lb.	
M-U-F	lb.	
Neozone (standard)	lb.	
A	lb.	
C	lb.	
D	lb.	
E	lb.	
Oxynone	lb.	
Parazone	lb.	
Permalux	lb.	
Solux	lb.	
Thermoflex	lb.	
A	lb.	
V-G-B	lb.	
Alkalies		
Caustic soda, flake, Columbia (400 lb. drums)	100 lbs.	3.00 / 4.00
liquid, 50%	100 lbs.	2.25
solid (700 lb. drums)	100 lbs.	2.60 / 3.60
Antiscorch Materials		
Antiscorch T	lb.	
Cumar RH	lb.	.085
Retarder B	lb.	
W	lb.	
U.T.B.	lb.	
Antisun Materials		
Heliozone	lb.	
Sunproof	lb.	
Binder, Fibrous		
Asbestos	ton	30.00
Brake Lining Saturants		
B. R. C. No. 553	lb.	.015 / .017
B. R. T. No. 3	lb.	.015 / .017
Colors		
BLACK		
Lampblack (commercial)	lb.	.15
BLUE		
Brilliant	lb.	
Prussian	lb.	$0.36½
Toners	lb.	.80 /$3.50
Ultramarine, dry, Group 1	lb.	.14
BROWN		
Mapico	lb.	.13
GREEN		
Brilliant	lb.	
Chrome, light	lb.	.20
medium	lb.	.20
oxide	lb.	.18½
Dark	lb.	
Guignet's	lb.	.75
Light	lb.	
Toners	lb.	.85 / 3.50
ORANGE		
Lake	lb.	
Toners	lb.	.40 / 1.60
ORCHID		
Toners	lb.	1.50 / 2.00
PINK		
Toners	lb.	1.50 / 4.00
PURPLE		
Permanent	lb.	
Toners	lb.	.60 / 2.00
RED		
Antimony		
Crimson, 15/17%	lb.	.47
R. M. P. No. 3	lb.	.46
Sulphur free	lb.	.48
Golden 15/17%	lb.	.28
7-A	lb.	.33
Z-2	lb.	.20
Aristi	lb.	1.85
Cadmium	lb.	.75 / .80
Chinese	lb.	
Crimson	lb.	
Iron Oxides		
Rub-Er-Red	lb.	.09½
Mapico	lb.	
Medium	lb.	
Scarlet	lb.	
Toners	lb.	.80 / 2.00
WHITE		
Lithopone (bags)	lb.	.04½/ .04¾
Albalith Black Label-11	lb.	.04½/ .04¾
Astrolith (5-ton lots)	lb.	.04½/ .04¾
Azolith	lb.	.04½/ .04¾
Cryptone-19	lb.	.06 / .06¼
CB-21	lb.	.06 / .06¼
Sunolith (5-ton lots)	lb.	.04½/ .04¾
XX-20 Zinc Sulphide	lb.	.10½/ .10¾
86	lb.	.10½/ .10¾
Ray-Bar	lb.	
Ray-Cal	lb.	
Rayox	lb.	
Titanolith (5-ton lots)	lb.	.06 / .06¼
Titanox-A	lb.	.17 / .18¾
B	lb.	.06 / .06½
C	lb.	.06 / .06½
Ti-Tone	lb.	
Zinc Oxide		
Anaconda, Green Seal No. 333	lb.	.09¾/ .09⅞
Lead Free No. 352	lb.	.05¾/ .06
No. 570	lb.	.05¾/ .06
No. 577	lb.	.05¾/ .06
Red Seal No. 222	lb.	.08¾/ .08⅞
U.S.P. No. 777 (bbls)	lb.	.12¾
White Seal No. 555	lb.	.10⅝

Azo ZZZ-11 ..... lb.	$0.05¾	/$0.06
44 ..... lb.	.05¾/	.06
55 ..... lb.	.05¾/	.06
66 ..... lb.	.05¾/	.06
French Process, Florence White Seal-7 (bbls.). lb.	.10½	
Green Seal-8 ..... lb.	.09⅜/	.09½
Red Seal-9 ..... lb.	.08⅜/	.08⅝
Kadox, Black Label-15 . lb.	.09⅜/	.09⅝
Blue Label-16 ..... lb.	.08⅜/	.08⅝
Red Label-17 ..... lb.	.07 /	.07¼
Horse Head Special 3.... lb.	.05¾/	.06
XX Red-4 ..... lb.	.05¾/	.06
23 ..... lb.	.05¾/	.06
72 ..... lb.	.05¾/	.06
78 ..... lb.	.05¾/	.06
80 ..... lb.	.05¾/	.06
103 ..... lb.	.05¾/	.06
110 ..... lb.	.05¾/	.06
St. Joe (lead free) Black Label No. 20.... lb.	.05¾/	.06
Green Label No. 42.... lb.	.05¾/	.06
Red Label No. 30..... lb.	.05¾/	.06
U.S.P. X (bbls.) ..... lb.	.12½	
YELLOW		
Cadmolith (cadmium yellow). lb.	.40 /	.45
Lemon ..... lb.		
Mapico ..... lb.	.09½	
Toners ..... lb.	2.50	

Dispersing Agents

Bardex ..... lb.	.023 /	.025
Bardol ..... lb.	.021 /	.023
Darvan ..... lb.		

Factice—See Rubber Substitutes

Fillers, Inert

Asbestine, c.l., f.o.b. mills. ton	15.00	
Barytes ..... ton	30.00	
f.o.b St. Louis (50 lb. paper bags)..... ton	22.85	
off color, domestic..... ton	22.50	/25.00
white, imported ..... ton	32.50	/35.00
Blanc fixe, dry, precip..... ton	70.00	/75.00
Calcene ..... ton	35.00	/45.00
Infusorial earth ..... lb.	.02	
Kalite No. 1 ..... ton		
No. 3 ..... ton		
Whiting		
Chalk, precipitated ..... lb.	.04¼/	.04¾
Columbia Filler ..... ton	9.00	/14.00
Domestic ..... 100 lbs.		
Guilders ..... 100 lbs.		
Hakuenka ..... lb.		
Paris white, English cliff-stone ..... 100 lbs.		
Southwark Brand, Commercial ..... 100 lbs.		
All other grades.. 100 lbs.		
Suprex, white, extra light. ton	45.40	/60.00
heavy ..... ton	45.40	/60.00
Sussex ..... ton		
Witco, c.l. ..... ton	7.00	
Wood flour ..... ton	20.00	/50.00

Fillers for Pliability

Fumonex, c.l., f.o.b. works, bags ..... lb.	.03	
l.c.l., f.o.b. warehouse .. lb.	.05½/	.07
P-33 ..... lb.		
Thermax ..... lb.		
Velvetex ..... lb.		

Finishes

IVCO lacquer, clear..... gal.	2.35	/ 2.60
colors ..... gal.	2.40	/ 4.50
Rubber lacquer, clear..... gal.		
colored ..... gal.		
Starch, corn, pwd..... 100 lbs.	3.68	/ 3.88
potato ..... lb.	.04½/	.05½
Talc, dusting ..... ton	20.00	/25.00
Pyrax ..... ton		

Flock

Cotton flock, dark..... lb.	.10½/	.11½
dyed ..... lb.	.50 /	.85
white ..... lb.	.14½/	.20
Rayon flock, colored..... lb.	1.25	/ 1.40
white ..... lb.	1.00	

Latex Compounding Ingredients

Alphasol-OS ..... lb.		
Antox, dispersed ..... lb.		
Aquarex D ..... lb.		
F ..... lb.		
Aresklene ..... lb.		
Casein, domestic, ground, 20-30 mesh ..... lb.	.10½/	.10¾
Catalpo ..... ton		
Color pastes, dispersed..... lb.		
Dispersaid ..... lb.	1.50	
Dispersex 10 ..... lb.		
15 ..... lb.		
20 ..... lb.		
Emo, brown ..... lb.	.13	
white ..... lb.	.13	
Factice Compound, dispersed ..... lb.	.25	
Heliozone, dispersed ..... lb.		
Igepon A..... lb.		
Nekal BX (dry)..... lb.		
Palmol ..... lb.	.085	
Stablex A ..... lb.		
B ..... lb.		
C ..... lb.		
Sulphur, colloidal ..... lb.		
Vulcan colors ..... lb.		
Zinc oxide, colloidal ..... lb.		

Mineral Rubber

B. R. C. No. 20..... lb.	$0.0125/$0.014	
Black Diamond ..... ton	25.00	
Genasco Hydrocarbon, granulated, (fact'y)... ton		
solid ..... ton		
Gilsonite Hydrocarbon (factory) ..... ton		
Hydrocarbon, hard ..... ton		
soft ..... ton		
Parmr Grade 1..... ton	25.00	/28.00
Grade 2 ..... ton	25.00	/28.00
265° ..... ton		

Mold Lubricants

Mold Paste No 1..... lb.		
Rusco mold paste..... lb.	.12 /	.30
Sericite ..... ton	65.00	/75.00
Soapbark ..... lb.		
Soapstone ..... ton	25.00	/30.00

Oils

Castor, blown, c.l., drums, returnable ..... lb.	.11½	

Reclaiming Oils

B. R. V..... lb.	.039 /	.041
S. R. O..... lb.	.012 /	.014

Reenforcers

Carbon Black		
Aerfloted Arrow Specification Black ..... lb.	.0535/	.0825
Arrow Compact Black... lb.		
Granulized Carbon Black ..... lb.		
Century (delivered) ..... lb.	.0445/	.0535
"Certified" Cabot ..... lb.		
Spheron ..... lb.		
Disperso (delivered) .... lb.	.0445/	.0535
Dixie, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex..... lb.	.0445	
c.l., delivered New York. lb.	.0535	
local stock delivered.. lb.	.07 /	.08¼
Dixiedensed, c.l, f.o.b. New Orleans, La., Galveston or Houston, Tex..... lb.	.0445	
c.l., delivered New York. lb.	.0535	
local stock delivered.. lb.	.07 /	.08¼
Excello, c.l., f.o.b Gulf ports ..... lb.	.0445	
delivered New York. lb.	.0535	
l.c.l., delivered New York ..... lb.	.07 /	.08¼
Gastex ..... lb.	.03 /	.07
Kosmobile, c.l., f.o.b New Orleans, La., Galveston or Houston, Tex..... lb.	.0445	
c.l., delivered New York. lb.	.0535	
local stock delivered.. lb.	.07 /	.08¼
Kosmos, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex..... lb.	.0445	
c.l., delivered New York. lb.	.0535	
local stock delivered.. lb.	.07 /	.08¼
Micronex Beads ..... lb.		
Mark II ..... lb.		
Standard ..... lb.		
W-5 ..... lb.		
W-6 ..... lb.		
Pelletex ..... lb.		
Supreme, c.l., f.o.b. Gulf ports ..... lb.	.0445	
delivered New York. lb.	.0535	
l.c.l., delivered New York ..... lb.	.07 /	.08¼
Carbonex ..... lb.	.030 /	.0375
Carbonex "S" ..... lb.	.0315/	.040
Clays		
Aerfloted Paragon .... ton	8.50	
Suprex No. 1 Selected. ton	10.00	
No. 2 Standard..... ton	8.50	
Dixie ..... ton		
Junior ..... ton		
McNamee ..... ton		
Par ..... ton		
Witco ..... ton	8.50	
Cumar EX ..... lb.	.04	

Reodorants

Amora A ..... lb.		
B ..... lb.		
C ..... lb.		
D ..... lb.		
Para-Dors ..... lb.		
Rodo No. 0..... lb.		
No. 10 ..... lb.		

Rubber Substitutes or Factice

Amberex ..... lb.	.15	
Black ..... lb.	.07 /	.11
Brown ..... lb.	.08 /	.12
Duphax A ..... lb.	.095	
B ..... lb.	.095	
Fac-Cel B ..... lb.	.12	
C ..... lb.	.12	
White ..... lb.	.08½/	.12

Softeners

B. R. C. No. 555..... lb.	.012 /	.014
B. R. T. No. 7..... lb.	.015 /	.017
Burgundy pitch ..... lb.	.04 /	.05
(net weight) ..... lb.	.07 /	.08½
Corn oil, crude (bbls.)..... lb.	.11	
Cycline oil ..... gal.	.15 /	.28
Palm oil (Witco)..... lb.	.06	
Petrolatum, light amber.... lb.	.02⅞/	.03⅛
Pigmentar (drums) ..... gal.	.25 /	.27
Pigmentaroil (drums) .... gal.	$0.25	/$0.27
Pine oil, dest. distilled (drums) ..... gal.	.44 /	.48
pitch ..... bbl.	6.00	
tar (drums) ..... gal.	.25 /	.27
Plastogen ..... lb.		
Reogen ..... lb.		
Rosin oil, compounded.... gal.	.40	
Rubtack ..... lb.	.10	
Tackol ..... lb.	.085 /	.18
Tonox ..... lb.		
Powder ..... lb.		
Witco No. 20 ..... gal.	.15	

Softeners for Hard Rubber Compounding

RSL Resin ..... lb.		
Resin C Pitch 55° C. M. P.... lb.	.0125/	.0145
Resin C Pitch 70° C. M. P.... lb.	.0125/	.0145
Resin C Pitch 85° C. M. P.... lb.	.0126/	.0145

Solvents

Benzol 90% (drums)..... gal.	.20	
Beta-Trichlorethane ..... gal.		
Bondogen ..... gal.		
Carbon bisulphide ..... lb.	.05¼/	.08½
tetrachloride ..... lb.	.05¼	
Dipentene, commercial (drums) ..... gal.	.42 /	.44
Rubber (Group 3, refinery) . gal.	.06⅞/	.07¼
Solvesso No. 1, tank cars. gal.	.17½	
No. 2 ..... gal.	.22½	
No. 3 ..... gal.	.17½	
No. 4 ..... gal.	.22½	
Turpentine, wood, dest. distilled (drums) ..... gal.	.41 /	.43

Stabilizers for Cure

Laurex, ton lots ..... lb.		
Stearex B ..... lb.	.11 /	.13
Beads ..... lb.	.09 /	.11
Stearic acid, dbl. pres'd.... lb.	.12 /	.14
Single pressed ..... lb.	.11 /	.13
Stearite ..... lb.	.08	
Zinc stearate ..... lb.	.22 /	.25

Synthetic Rubber

DuPrene Latex Type 50.. gal.		
Type D ..... lb.		

Tackifier

B. R. H. No. 2..... lb.	.015 /	.020

Varnish

Shoe ..... gal.	1.45	

Vulcanizing Ingredients

Sulphur		
Chloride, drums ..... lb.	.03½/	.04
Flowers, extrafine refined, U.S.P. ...100 lbs.		
Rubber ..... 100 lbs.	1.95	/ 2.80
Telloy ..... lb.		
Vandex ..... lb.		

(See also Colors—Antimony)

Waxes

Carnauba, No. 3 chalky... lb.	.33½/	.34
2 N.C. ..... lb.	.35½/	.36
3 N.C. ..... lb.	.34½/	.35
1 Yellow ..... lb.	.42 /	.43
2 ..... lb.	.40 /	.41
Montan, crude ..... lb.	.11	

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for June, 1935, in Tons:

Rubber Exports: Ocean shipments from Singapore, Penang, Malacca, and Port Swettenham

	June, 1935	
To	Sheet and Crepe Rubber	Latex, Concentrated Latex, Revertex, and Other Forms of Latex
United Kingdom	8,812	370
United States	29,929	506
Continent of Europe...	5,623	150
British possessions	2,167	3
Japan	1,987	16
Other countries	180	8
Totals	48,698	1,053

Rubber Imports: Actual, by Land and Sea

	Dry Rubber	Wet Rubber
From		
Sumatra	3,188	4,584
Dutch Borneo	3,246	1,529
Java and other Dutch islands..	351	2
Sarawak	1,909	122
British Borneo	382	9
Burma	221	10
Siam	1,851	1,018
French Indo-China	65	61
Other countries	85	4
Totals	11,298	7,339

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	June 1	June 29	July 6	July 13	July 20
June	11.18	....	....	....	....
July	11.20	11.83	11.98	11.98	11.81
Sept.	11.01	11.61	11.76	11.76	11.59
Dec.	10.97	11.51	11.64	11.64	11.28
Mar.	11.09	11.54	11.67	11.64	11.27
May	11.14	11.59	11.70	11.69	11.25

THE above table gives the nearest first and last week-end closing prices of the month previous to that under review, also the week-end closing prices of each week of last month up to time of going to press. This plan permits tracing at a glance the prices of representative futures for approximately two consecutive months.

Price gains in June were 45 to 63 points, with the July contract showing the greatest preference. Trading was mainly dull. The Government furnished the principal activity and caused most of the gains which recovered the losses resulting from NRA annulment.

July began with a continuation of the upward price trend of June apparently influenced by Government pool transactions, professional and foreign buying, and favorable acreage predictions ranging from 28,500,000 to 30,131,000 and confirmed by the Government's forecast reported July 8 as 29,166,000, which was only 4.6% above last season's planting. After the Circuit Court of Appeals' decision, July 16, in the Hoosac Mills case, outlawing the AAA processing and floor taxes, traders were even less inclined to trade than usual, which has been of a very cautious kind for the past several months since the Government has been the dominating factor. All prices declined, but those of December and later contracts suffered most since the Supreme Court ruling, expected in December, may be detrimental to those contracts. The gains registered the forepart of July were offset in this reaction for the July contracts; while the later ones lost in addition 2 to 34 points.

Senator Bankhead stated, after the Senate had passed the amended AAA program July 24, that the President, upon signing it, would announce a continuance of the cotton-loan policy and that the loan value cannot be less than 12¢ and that it is hoped to be 13¢. He also declared that the loans will be advanced by the Reconstruction Finance Corp.; the right of which body to do so has never been questioned in the courts.

The Journal of Commerce reports that the Government claims to have the cotton market cornered and that mills will have to pay 12½ to 13¢ for their staple. The Cotton Producers' Pool reported to the New York Cotton Exchange that on July 18 the Government held 649,834 bales of spot cotton and 901,600 of futures. Since the Government does not have an exchange membership, the commissions on these transactions will amount to $270,480 and that the margin coverage involves $27,048,000 investment in addition to funds to cover current calls on price declines.

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
June 29	12.02
July 6	12.30
July 13	12.38
July 20	12.31
July 27	12.15

New York Quotations

July 27, 1935

Drills		
38-inch 2.00-yard	yd.	$0.14⅝
40-inch 3.47-yard		.09
50-inch 1.52-yard		.21½
52-inch 1.85-yard		.18¼
52-inch 1.90-yard		.15⅝
52-inch 2.20-yard		.14⅜
52-inch 2.50-yard		.12⅜
59-inch 1.85-yard		.15½
Ducks		
38-inch 2.00-yard D. F.	yd.	.14¼/.14¾
40-inch 1.45-yard S. F.		.20¾
51½-inch 1.35-yard D. F.		.21¾
72-inch 1.05-yard D. F.		.28⅝/.29½
72-inch 17.21-ounce		.33⅜
MECHANICALS		
Hose and belting	lb.	.34
TENNIS		
52-inch 1.35-yard	yd.	.22⅞
***Hollands**		
GOLD SEAL		
30-inch No. 72	yd.	.19
40-inch No. 72		.20
RED SEAL		
30-inch	yd.	.16½
40-inch		.17½
50-inch		.23
Osnaburgs		
40-inch 2.34-yard	yd.	.11¾/.12⅝
40-inch 2.48-yard		.11⅝
40-inch 2.56-yard		.10¾
40-inch 3.00-yard		.10
40-inch 7-ounce part waste		.11
40-inch 10-ounce part waste		.16⅜
37-inch 2.42-yard		.12¼
Raincoat Fabrics		
COTTON		
Bombazine 60 x 64	yd.	.08¾
Plaids 60 x 48		.10½
Surface prints 60 x 64		.11½
Print cloth, 38½-inch, 60 x 64		.06
SHEETINGS, 40-INCH		
48 x 44, 2.50-yard	yd.	.10½
64 x 68, 3.15-yard		.09⅝
56 x 60, 3.60-yard		.08¼
44 x 48, 3.75-yard		.06⅝
SHEETINGS, 36-INCH		
48 x 40, 5.00-yard	yd.	.05⅝
44 x 40, 6.15-yard		.04⅞
Tire Fabrics		
BUILDER		
17¼ ounce 60" 23/11 ply Karded peeler	lb.	.37
CHAFER		
14 ounce 60" 20/8 ply Karded peeler	lb.	.37
9¼ ounce 60" 10/2 ply Karded peeler	lb.	.37
CORD FABRICS		
23/5/3 Karded peeler, 1 1/32" cotton	lb.	.37
15/3/3 Karded peeler, 1 1/32" cotton	lb.	.35
23/5/3 Karded peeler, 1¼" cotton	lb.	.42
23/5/3 Combed Egyptian	lb.	.51
LENO BREAKER		
8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.32

*For less than 1,000 yards of a width add 10% to given prices.

The Census Bureau reported domestic consumption in June to be 385,946 bales and of June, 1934, 363,262 bales. Estimates for the full season show a reduction of 400,000 bales as against the previous year. Exports are running 2,600,000 bales less than that of a year ago.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. The textile market as to coarse yarn specialty fabrics remains about as it was a month ago, and the demand continues fair. The market is under the influence of the recent decision relating to taxes affecting cotton textiles. Supplies in the hands of jobbers and consumers are sparse. Mills have reduced working schedules and are keeping inventories under careful control.

RAINCOAT FABRICS. The fall raincoat business is starting, and the present outlook indicates that all manufacturers in the line will have a very good season.

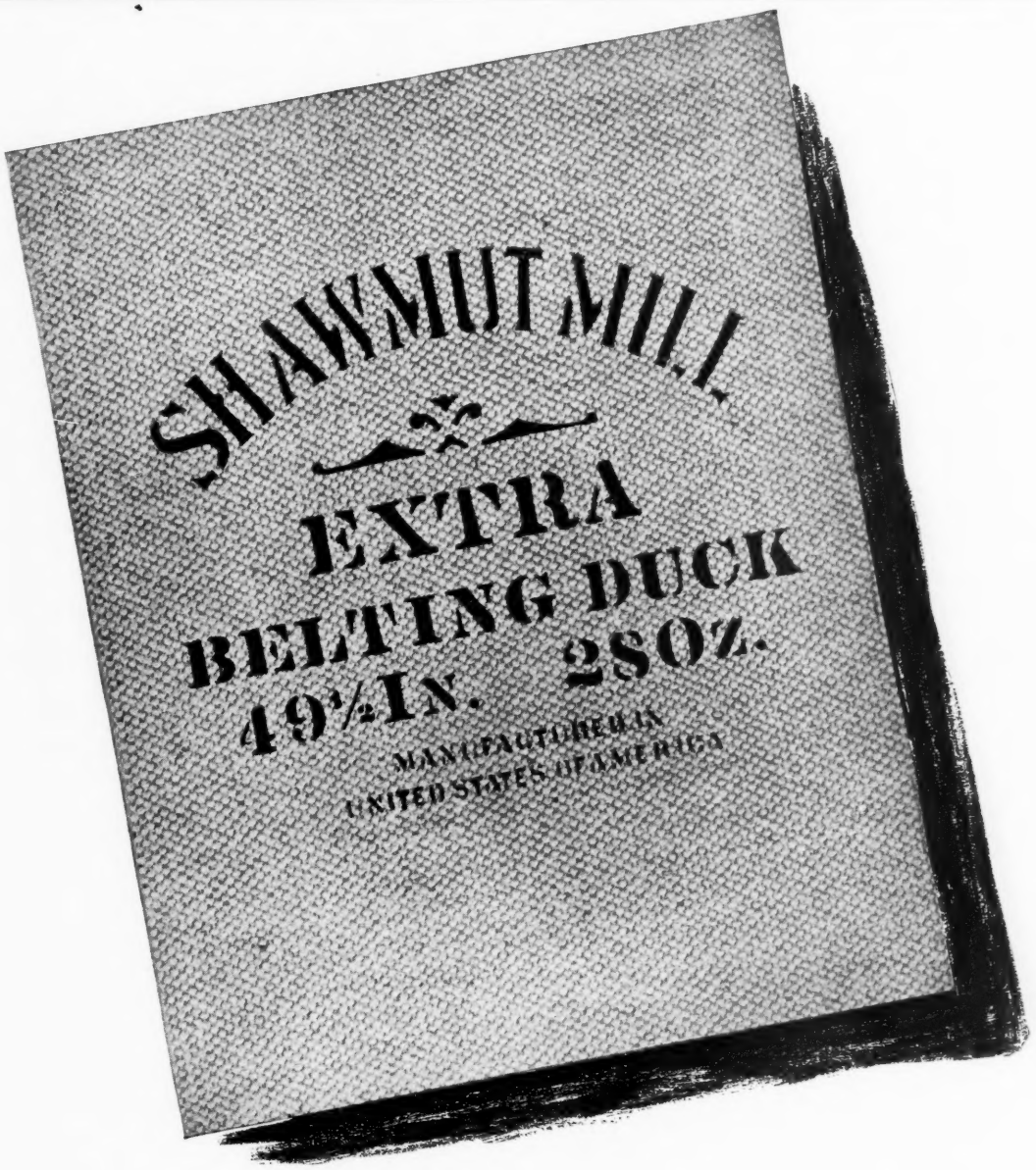
SHEETINGS. The market is very quiet, particularly since the recent Circuit Court decision on the unconstitutionality of the AAA. Until the resulting complications and proposed pending amendments are cleaned up, revival of general buying of fabrics is not expected.

TIRE FABRICS. Demand is moderate and seasonal; while prices continue steady and unchanged.

Rubber Trade Inquiries

(*Continued from page* 54)

No.	INQUIRY
1816	Information wanted on uniting rubber to metal.
1817	Dealer in rubber scrap.
1818	Manufacturer of a machine for assembling link rubber mats.
1819	Wanted: titles of books and magazines dealing with the operation of tire and service stations.
1820	Manufacturer of a machine for wrapping wire with paper for insulation purposes.
1821	Manufacturer of Kelsanite.
1822	Manufacturer of Chamva.
1823	Manufacturer of Tos-Tops.
1824	Manufacturer of Bardol.
1825	Manufacturer of Darvan.
1826	Manufacturer of rubber tired wheels about 1¼ inches in diameter for toy automobiles.
1827	Manufacturer of fountain stencil brush.
1828	Manufacturer of mold lubricant.
1829	Manufacturer of molded rubber fan belts.
1830	Manufacturer of powdered rubber.
1831	Manufacturer of Japanese hemicellulose.
1832	Manufacturer of dimethyl and diethyl sulphate.
1833	Manufacturer of 13-ounce karded peeler tire cord.
1834	Manufacturer of "Queratine."
1835	Manufacturer of a rubber compound for sealing cans.
1836	Manufacturer of sponge rubber mats.
1837	Manufacturer of accelerator tetramethyl thiuram monosulphide.
1838	Manufacturer of "Rubber Water Beds."
1839	Manufacturer of brake lining saturant B.R.C. 553.
1840	Manufacturer of brake lining saturant B.R.T. No. 3.
1841	Manufacturer of replacement belts for vacuum cleaners.
1842	Manufacturer of rubber wheels for vacuum cleaners.
1843	Manufacturer of fittings for ice bags.
1844	Supplier of gutta percha.
1845	Manufacturer of machinery for making heels.
1846	Manufacturer of Rusco mold paste.



For many years we have worked closely with leading rubber companies in supplying standard or specification fabrics for Hose and Belting requirements, and for a wide variety of other products combining rubber and cotton textiles. One copy of our 538-page "Handbook of Industrial Fabrics" is available to any well-rated rubber manufacturer in the United States. Additional copies may be secured at the regular price of $2.00.

WELLINGTON SEARS COMPANY

65 WORTH STREET, NEW YORK CITY

Boston • Philadelphia • Atlanta • Detroit • Chicago • St. Louis • New Orleans • San Francisco

IMPORTS, CONSUMPTION, AND STOCKS

CRUDE rubber consumption by United States manufacturers for June, 1935, totaled 36,623 long tons, compared with 41,568 long tons for May, 1935, a decrease of 11.9% below May and 8.8% under June, 1934, according to R. M. A. statistics. Consumption for June, 1934, was 40,147 (revised) long tons.

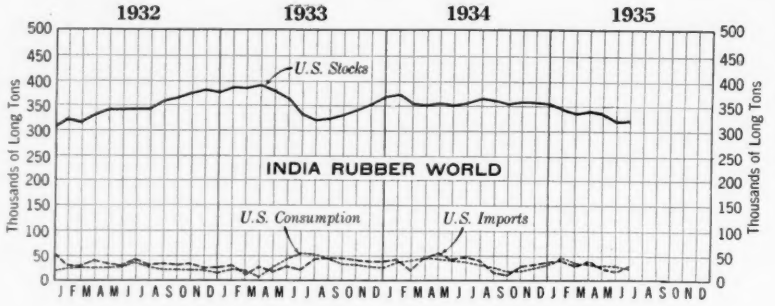
Crude rubber imports for June were 38,340 long tons, an increase of 42.7% above the May figure of 26,866 long tons, but were 22.8% under 49,683 long tons imported in June, 1934.

The estimated total domestic stocks of crude rubber on hand June 30 were 320,470 long tons, compared with May 31 stocks of 319,281 long tons and 358,461 long tons on hand June 30, 1934.

Crude rubber afloat for the United States ports on June 30 was 55,581 long tons, compared with 44,375 long tons afloat on May 31 and 46,698 long tons afloat on June 30, 1934.

London and Liverpool Stocks

Week Ended	Tons	
	London	Liverpool
June 29	97,112	73,257
July 6	98,302	74,211
July 13	98,784	74,527
July 20	97,934	74,250
July 27	98,342	74,766



United States Stocks, Imports, and Consumption

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

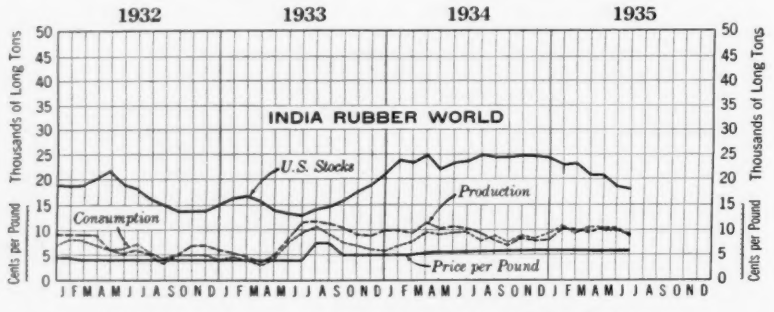
Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks Mfgrs., Importers, Dealers, Etc.† Tons	U. S. Stocks Afloat† Tons	U. K.— Public Warehouses, London, Liverpool†‡ Tons	Singapore and Penang Dealers and Port Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1933	411,615	401,000	365,000	55,606	86,505	44,884	850,300	798,900	616,370
1934	469,484	453,223	355,000	47,644	134,927	62,142	1,016,784	959,556	678,994
1935									
January	42,059	47,103	346,084	42,066	148,337	59,609	79,813	89,216	671,954
February	35,383	43,187	337,332	42,969	155,727	57,586	75,775	90,494	658,717
March	44,041	42,620	338,700	44,485	162,012	55,100	66,686	88,112	652,659
April	43,545	44,714	334,954	37,651	165,064	48,827	76,474	80,722	651,471
May	26,866	41,568	319,281	44,375	167,745	54,740	77,503	.....	648,991
June	38,340	36,623	320,470	55,581	.....	.....	.....	.....	.....

*Including liquid latex. †Stocks on hand the last of the month or year. ‡Statistical Bulletin of the International Rubber Regulation Committee. §Stocks at U. S. A., U. K., Singapore and Penang, Para, Manaos, and afloat.

RECLAIMED RUBBER

PRODUCTION and consumption each fell off noticeably in July. The decline in demand for reclaim was spotty rather than general, and the summer seasonal slump is less pronounced than usual. Reclaimers are optimistic regarding the outlook for future business, particularly in automotive accessories, wire insulation, battery boxes, and mechanical goods lines.

Quotations on all grades are unchanged from the figures recorded last month.



Production, Consumption, Stocks, and Price of Tire Reclaim

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1933	99,974	81,612	20.1	20,746	3,583
1934	110,010	100,597	22.3	23,079	4,737
1935					
January	10,465	11,261	23.9	22,291	517
February	10,072	9,374	21.7	22,989	532
March	9,741	10,549	24.8	20,637	310
April	10,315	10,466	23.4	20,521	476
May	10,223	9,938	23.9	18,541	402
June	8,590	8,710	23.8	17,932	....

*Stocks on hand the last of the month or year.
Compiled by The Rubber Manufacturers Association, Inc.

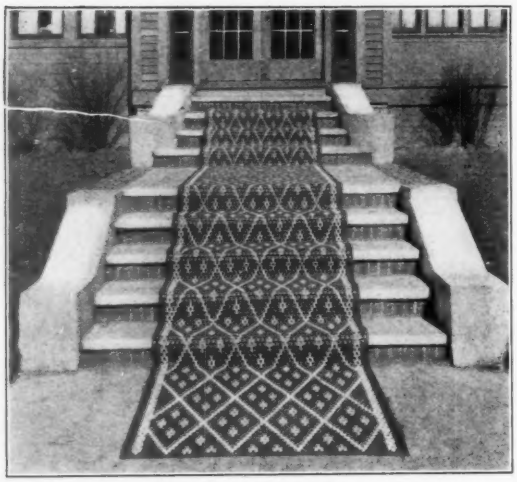
New York Quotations

July 27, 1935

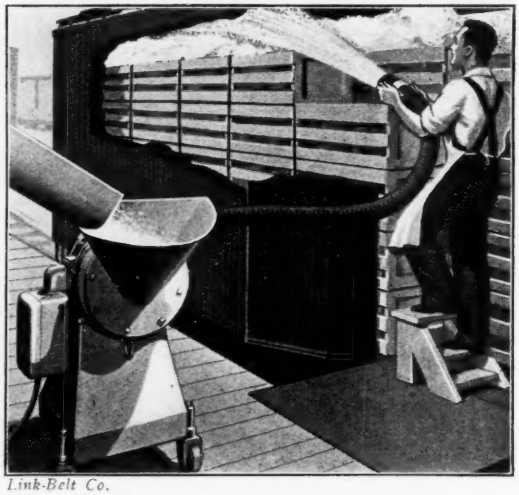
	Spec. Grav.	Cents per lb.
High Tensile		
Super-reclaim, black	1.20	8¾/9
red	1.20	7 /7¼
Auto Tire		
Black	1.21	5 /5¼
Black selected tires	1.18	5¼/5½
Dark gray	1.35	6¼/6½
White	1.40	9¼/9½
Shoe		
Unwashed	1.60	6½/6¾
Washed	1.50	8 /9
Tube		
No. 1	1.00	13 /
No. 2	1.10	7½/7¾
Truck Tire		
Truck tire, heavy gravity	1.55	5½/6
Truck tire, light gravity	1.40	6 /6¼
Miscellaneous		
Mechanical blends	1.60	4¼/4½

A URUGUAYAN PRESIDENTIAL DECREE OF MAY 22, 1935, promulgated May 27, 1935, made certain corrections and changes in the list of the sizes of tires for trucks, tractors, and omnibusses which are permitted conditional duty-free entry into Uruguay under the law of October 21, 1931, according to a report dated May 28, 1935, from Consul General Leslie E. Reed, Montevideo.

New Goods and Specialties



Ezy-Rug in Service



Link-Belt Co.

Top-Icing a Carload of Green Vegetables

Rubber in Flexible Mats

A NEW and attractive matting, patented as the Ezy-Rug, here illustrated, offers a wide variety of practical uses. This mat is made of an extruded rubber product having a high percentage of crude gum, but no fabric combination or composition or reclaimed rubber, thus permitting the use of many beautiful colors. The finished product has no metal showing; yet is so flexible, it can be easily rolled. Every Ezy-Rug is custom built to specifications. By the use of fifteen different colors practically any design or color combination can be built to conform with the customer's particular color scheme. Effective lettering can also be furnished—to create an important advertising means.

The outstanding features claimed for this rug follow: thorough removal of dirt, use in any weather, indoors and out, comfort, silence, pleasing color combinations, advertising value, lettering or names thereon, long wear, non-slip surface, sanitary, and easily cleaned and handled.

Among the places where this rubber matting will prove useful are homes, churches, clubs, public and office buildings, theaters, stores, busses, hospitals, power houses, industrial plants, institutions, and ships. Toledo Rubber Products Corp.

Improved Car Battery

THE Goodrich 1935 line of automobile storage batteries is headed by the new 145-24 Electro-Pak, having a striking stippled design on the outside of its case, and another new product, the Electro-Start. Electro-Pak, it is said, will deliver 20% more power than ordinary batteries of similar size, the result of using 45 plates in the three cells instead of the usual 39 and by making these plates oversize, each ½ inch higher than those in an ordinary battery of the same size.

Previous to public announcement of the new product the manufacturer conducted a series of rigorous tests, checked and certified by Western Union, to verify unusual performances by Electro-Pak.

Besides the excess power other advantages listed by the maker follow. Power saving top cover prevents acid spray from collecting on the terminals, and any metal objects or dirt from falling on top of the battery and causing shorts. Patented vent caps hold the top cover firmly in place and carry vapor away from terminals. Acid-Seal cell covers, welded to terminal posts, fit snugly; so acid solution cannot creep up along the posts and cause corrosion. Full capacity connectors and posts are designed to carry entire flow of current, giving quicker, surer starts, smoother operation. Positive plate protectors prolong life of the battery if plates buckle from lack of water in the battery or some other reason. Highest grade Port Orford Cedar separators are used.

New Electro-Pak

The Electro-Start, also in the new stipple design, has 51 plates, 134 ampere rating, and 110 ampere-hour capacity. Refinements and improvements in every other unit of the line also are announced by The B. F. Goodrich Co.

Car Icing Hose

THE new method of top-icing shipments of green vegetables in refrigerator cars is accomplished as shown in the illustration by means of a portable ice slinger. Ice ground to the fineness of snow is delivered to the slinger from a screw conveyer overhead or from a portable ice crusher with inclined loading conveyer. Three wheels support the ice slinger. The front wheel swivels with a pulling handle, by which the machine may be moved along from car to car on a platform at the car-floor level. A length of six-inch smooth bore suction hose attached to the discharge pipe is provided with a cup-shaped sprayer by means of which the operator can deliver the ground ice evenly over the entire carload or wherever it is directed.

Top-icing eliminates the necessity of bunker icing and prevents center heating. The settling of the ice over and around the contents of the car provides a packing effect which reduces damage due to rough handling. The high-speed blast of ice entering the car forces out all warm air and thus has a decided precooling effect. Cars iced by this method have crossed the continent without reicing.

CLASSIFIED ADVERTISEMENTS

ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

GENERAL RATES	SITUATIONS WANTED RATES	SITUATIONS OPEN RATES
Light face type $1.00 per line (ten words)	Light face type 40c per line (ten words)	Light face type 75c per line (ten words)
Bold face type $1.25 per line (eight words)	Bold face type 55c per line (eight words)	Bold face type $1.00 per line (eight words)

Allow nine words for keyed address. *Replies forwarded without charge.*

SITUATIONS WANTED

WANTED: POSITION AS DEPARTMENT FOREMAN IN CALENder and mill room. 18 years' experience. Small plant preferred any place in the U. S. A. Experience in tires, tubes, raincoats, tennis shoes, garden hose, and many other articles in rubber. Address 22 Watters Avenue, Akron, Ohio.

LATEX CHEMIST: YOUNG MAN WITH PRACTICAL experience. Address Box No. 535, care of INDIA RUBBER WORLD.

EXPERIENCED SALESMAN, WITH STRONG FOLLOWING IN New York and surrounding territories, seeks connection with mill capable of handling volume of business on rubberized fabrics, quarter linings, suedines, proofing, etc. Now employed, but desires to associate with progressive firm engaged in above type of business. Address Box No. 539, care of INDIA RUBBER WORLD.

SALESMAN, EXPERIENCED, WISHES TO REPRESENT MILL manufacturing molded and mechanical rubber articles suitable for the chain stores, housefurnishing and drug jobbers, etc. Would like to hear from progressive manufacturer who is seeking volume of business in above trades. Am also in position to finance articles of merit if necessary. Address Box No. 540, care of INDIA RUBBER WORLD.

GRADUATE CHEMIST, AGE 33, ASSISTANT SUPERINTENDENT or executive. Nine years' experience in diversified mechanical goods. Thorough knowledge of compounding, factory development and production. Molded goods expert. At present employed. Address Box No. 541, care of INDIA RUBBER WOPLD.

SITUATIONS WANTED—Continued

CHEMIST, B.SC., 7 YEARS' EXPERIENCE IN RUBBER, BOTH technical and practical. Thorough knowledge of compounding in wide variety of products. Now in charge of compound development and control in small plant. Address Box No. 542, care of INDIA RUBBER WORLD.

POSITION WANTED WITH PROGRESSIVE COMPANY MANUFACturing mechanicals, dipped goods, or hard rubber, as superintendent or chemist. Fully qualified by long experience in similar capacities with reputable companies. Diplomatic, energetic, capable. Address Box No. 544, care of INDIA RUBBER WORLD.

SALES CHEMIST: POSITION AS CONTACT MAN, with experience in proofing, mechanicals, and cements, by graduate chemist at present employed in a laboratory. Address Box No. 545, care of INDIA RUBBER WORLD.

SITUATIONS OPEN

WANTED: MAN WITH PRACTICAL PROOFING EXPERIENCE, capable of developing new coatings. State experience and outline past accomplishments. Applications will be treated confidential. Address Box No. 537, care of INDIA RUBBER WORLD.

WANTED: PARTY THOROUGHLY FAMILIAR WITH EASTERN consumers of crude rubber. Applicant must have established following of customers. Salary, commission, or profit-sharing arrangement. Apply with full particulars of experience to Box No. 538, care of INDIA RUBBER WORLD.

TECHNICAL MANAGER RUBBER FACTORY

Important, well reputed Scandinavian Rubber Factory requires as manager of production of technical rubber articles for industry and trade, including hard rubber, exceedingly clever man with wide practical experience. Good experience in new latex methods to extend manufacturing range desirable. Appointment from September. Salary £1,000 to £2,000 yearly.

Write fully stating experience and qualifications, preferably with photo, to Box No. 527, care of INDIA RUBBER WORLD, 420 Lexington Ave., New York, N. Y., marked "all 'round expert manufacture technical rubber goods."

(*Advertisements continued on page 77*)

U. S. Crude and Waste Rubber Imports for 1935

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1935	Totals 1934	Balata	Miscellaneous	Waste
Jan. .....tons	41,188	599	201	30	41	..	..	42,059	46,204	26	553	..
Feb.	33,722	388	1,208	14	51	..	..	35,383	31,032	73	194	29
Mar.	42,373	967	513	167	21	..	..	44,041	44,605	55	659	40
Apr.	41,857	1,089	531	63	5	..	..	43,545	45,662	60	644	14
May	25,256	1,106	294	60	..	50	..	26,766	47,954	55	474	16
June	36,833	860	467	80	..	100	..	38,340	49,683	135	521	20
Total, 6 mos., 1935 .....tons	221,229	5,009	3,214	414	118	150	..	230,134	.....	404	3,045	119
Total, 6 mos., 1934 .....tons	257,465	5,916	1,370	61	28	300	..	.....	265,140	748	3,517	432

Compiled from The Rubber Manufacturers Association, Inc., statistics.

United States Latex Imports

Year	Pounds	Value
1931	10,414,712	$884,355
1932	11,388,156	601,999
1933	24,829,861	1,833,671
1934	29,276,134	3,633,253
1935		
Jan.	1,898,962	287,583
Feb.	1,282,941	179,583
Mar.	2,889,525	354,654
Apr.	3,854,892	415,100
May	3,197,450	380,844

Data from Leather and Rubber Division, United States Department of Commerce, Washington, D. C.

Tire Production Statistics

	Pneumatic Casings—All Types: Inventory	Pneumatic Casings—All Types: Production	Pneumatic Casings—All Types: Total Shipments	Solid and Cushion Tires
1933	7,110,456	36,243,384	35,274,970	26,271
1934	9,171,335	45,815,763	45,285,955	34,710
1935				
Jan.	10,085,737	4,487,679	3,552,737	31,581
Feb.	11,183,674	4,251,183	3,188,772	.....
Mar.	11,325,010	4,215,214	4,078,007	.....
Apr.	10,673,140	4,376,383	4,989,291	.....
May	10,796,842	4,049,915	3,945,364	.....

	Inner Tubes—All Types: Inventory	Inner Tubes—All Types: Production	Inner Tubes—All Types: Total Shipments	Solid and Cushion Tires
1933	6,251,941	34,044,689	33,112,472	130,987
1934	8,904,496	44,840,971	43,694,130	197,497
1935				
Jan.	9,332,489	4,131,004	3,610,371	21,510
Feb.	10,151,721	4,046,062	3,261,488	17,657
Mar.	10,094,170	3,999,030	4,043,350	17,603
Apr.	9,864,446	4,131,658	4,319,648	20,002
May	10,296,437	3,775,145	3,347,258	22,533

	Solid and Cushion Tires	Consumption of Motor Gasoline (100%) Gallons
1933	126,990	
1934	187,152	
1935		
Jan.	20,300	
Feb.	16,183	
Mar.	20,224	
Apr.	21,783	
May	21,150	

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires: Cotton Fabric Pounds	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires: Crude Rubber Pounds	Consumption of Motor Gasoline (100%) Gallons
1933...	148,989,293	512,489,423	15,880,746,000
1934...	196,069,495	697,558,218	17,063,298,000
1935			
Jan.....	19,607,932	72,968,356	1,178,604,000
Feb....	18,058,726	66,463,131	1,133,378,000
Mar....	17,581,651	64,583,859	1,343,874,000
Apr....	17,944,131	71,286,972	1,515,129,000
May...	17,328,212	67,822,472	1,641,738,000

Rubber Manufacturers Association, Inc., figures representing approximately 97% of the industry for 1934 and 1935 and 80% for previous years, with the exception of gasoline consumption.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	Commodity	City and Country
†9,074	Acidproof suits and aprons	Prague, Czechoslovakia
†9,078	Tires	Brussels, Belgium
*9,090	Vulcanizing equipment including mixing mill, press, and tube extruder	Santiago, Chile
†9,092	Catheters and other surgical goods	Prague, Czechoslovakia
†9,133	Flooring, sponges, gloves, hose, bathing caps and shoes, and sundries	Santiago, Chile
†9,135	Druggists' sundries	Cairo, Egypt
*9,200	Cotton covered gasoline hose with couplings	Rotterdam, Netherlands

*Purchase. †Agency.

World Net Imports of Crude Rubber

Year	U.S.A.	U.K.	Australia	Belgium	Canada	Central Europe	France	Germany	Italy	Japan	Russia	Rest of the World	Total
1927	403,400	59,800	9,500	6,500	26,400	8,200	35,700	38,900	11,300	20,500	14,000	8,300	642,500
1928	407,500	4,400	8,400	7,900	30,900	10,000	38,000	37,900	12,400	25,800	8,000	12,300	603,500
1929	528,600	122,800	15,900	9,400	35,500	13,900	61,800	49,100	16,400	34,300	12,700	16,700	917,100
1930	457,400	120,000	5,400	10,700	28,800	12,100	71,400	45,800	18,600	33,000	16,700	19,300	839,200
1931	476,200	85,200	7,700	11,000	25,300	15,200	47,800	39,200	10,100	43,500	30,700	20,800	812,700
1932	393,800	43,500	12,400	9,500	20,900	15,800	41,700	45,000	15,300	56,100	30,000	26,800	710,800
1933	398,400	73,300	13,500	11,200	19,300	18,900	63,100	54,100	19,300	66,900	30,800	30,100	798,900
1934	438,941	158,481	9,642	9,116	28,439	23,427	50,405	59,330	21,403	69,934	47,272	43,166	959,556
1935													
Jan.	39,546	20,383	1,099	419	2,670	1,966	5,678	4,286	1,648	4,402	3,446	3,673	89,216
Feb.	45,999	15,609	848	399	1,558	2,547	4,670	3,513	4,357	5,585	1,810	3,599	90,494
Mar.	44,772	12,810	1,458	240	2,710	1,463	4,085	6,353	1,582	4,423	4,624	3,592	88,112
Apr.	40,360	11,574	1,150	520	1,063	1,591	3,369	5,820	1,653	6,635	3,387	*3,600	80,722

* Estimate. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Shipments of Crude Rubber from Producing Countries

Year	Malaya including Brunei and Labuan	N.E.I.	Ceylon	India	Burma	North Borneo	Sarawak	Siam	French Indo-China	Philippines and Oceania: Total	Philippines and Oceania: Oceania	Africa	South America	Mexican Guayule	Grand Total
1927	242,000	229,000	55,400	7,000	5,800	6,600	11,200	4,700	8,900	570,600	1,300	8,500	30,800	5,000	616,200
1928	299,000	229,000	58,000	7,200	4,800	7,000	10,600	4,100	9,100	628,800	1,300	7,500	21,600	3,000	662,200
1929	457,000	255,000	80,300	7,900	5,500	7,400	11,200	4,300	9,500	838,100	900	6,300	21,300	1,300	867,900
1930	443,000	241,000	75,600	6,800	5,200	7,100	10,600	4,700	9,700	803,700	1,200	4,900	14,300	1,000	825,100
1931	423,000	257,000	62,300	5,400	4,200	6,200	10,400	3,600	11,000	783,100	900	3,500	12,200	0	799,700
1932	406,000	211,000	49,300	1,100	3,000	5,400	7,100	3,000	13,500	699,400	800	2,100	6,500	0	708,800
1933	445,800	280,800	63,800	1,500	3,400	7,800	11,100	7,000	15,900	837,100	1,100*	2,000	10,100	0	850,300
1934	467,030	379,401	79,068	5,735	5,719	11,086	17,708	17,714	19,628	1,003,089	1,233*	2,921	9,143	398	1,016,784
1935															
Jan.	41,665	18,679	6,294	1,549	945	1,238	1,574	2,614	2,575	77,133	105	467	2,108	0	79,813
Feb.	32,824	27,835	5,551	331	489	760	1,922	2,288	2,018	74,018	156	254	1,347	0	75,775
Mar.	34,047	22,402	1,720	257	471	773	1,901	2,076	1,440	65,087	82	525	992	0	66,686
Apr.	37,442	26,156	3,749	139	263	846	1,895	1,661	2,827	74,978	100*	250*	1,146	0	76,474
May	27,746	35,932	4,473	265	484	848	2,003	2,752	1,800	76,303	100*	350*	700*	50	77,503

*Estimate. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Classified Advertisements

Continued

SITUATIONS OPEN—Continued

CALENDER MAN WANTED: TO BE THOROUGHLY FAMILIAR with gum rubber products, sheeting, and calendering cloth to take charge of large mill room. Address Box No. 543, care of INDIA RUBBER WORLD.

A LIVE MECHANICAL GOODS SALESMAN. CAN MAKE A PROFitable connection on a commission basis with a progressive rubber company now manufacturing a line of extruded and molded products. Replies will be treated confidentially. Address Box No. 546, care of INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

SPACE WANTED: FOR PRODUCTION OF A PRODUCT ALLIED with the rubber industry. A concern 10 years in business requires 5,000 square feet and part time use of 60" mixing mill on rental basis. Balance of equipment owned. Location Northern New Jersey, New York, or Long Island. Address Box No. 536, care of INDIA RUBBER WORLD.

(Advertisements continued on page 80)

United States Statistics

Imports for Consumption of Crude and Manufactured Rubber

	April, 1935		Four Months Ended April, 1935	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	89,006,154	$10,096,487	385,351,116	$45,041,189
Liquid latex	3,854,892	415,100	9,926,320	1,236,920
Jelutong or pontianak	937,623	58,429	3,532,092	253,019
Balata	114,399	11,452	563,265	83,217
Gutta percha	162,653	19,231	1,978,299	273,003
Scrap and reclaimed, etc.	647,329	5,364	1,781,385	16,389
Totals	94,723,050	$10,606,063	403,132,477	$46,903,737
Chicle, crude *Free*	72,373	$14,344	2,554,412	$584,364
MANUFACTURED—*Dutiable*				
Rubber soled footwear with fabric uppers *pairs*	111,396	$13,329	331,697	$88,768
Rubber toys	95,252	11,011	467,111	55,797
Druggists' sundries, n. e. s.	.....	11,438	.....	33,352
Combs, hard rubber *number*	70,164	3,881	208,092	11,610
Golf balls *number*	80,604	13,965	169,164	29,597
Tennis and other rubber balls *number*	486,498	32,658	1,990,223	81,998
Tires *number*	8,345	2,301	11,503	9,061
Other rubber manufactures	.....	46,757	.....	143,104
Totals	.....	$135,340	.....	$453,287

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	2,455,228	$285,903	12,961,369	$1,530,951
Balata	12,378	2,719	70,206	16,766
Gutta percha, rubber substitutes, and scrap	2,736	267	23,840	3,730
Rubber manufactures	.....	721	.....	8,851
Totals	.....	$289,610	.....	$1,560,298

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	1,066,324	$52,102	4,110,124	$201,535
Scrap	3,124,650	62,164	17,286,426	317,560
Rubberized automobile cloth, *sq. yd.*	41,172	22,373	159,160	86,504
Other rubberized piece goods and hospital sheeting *sq. yd.*	101,265	42,185	384,591	145,412
Footwear				
Boots *pairs*	6,896	13,918	29,107	63,695
Shoes *pairs*	21,344	11,710	55,630	32,591
Canvas shoes with rubber soles *pairs*	114,162	50,716	236,909	113,862
Soles *doz. pairs*	1,804	3,436	7,394	12,818
Heels *doz. pairs*	37,966	22,626	149,899	87,028
Soling and top lift sheets	21,736	5,440	83,858	15,040
Water bottles and fountain syringes *number*	13,169	5,295	53,190	20,318
Gloves *doz. pairs*	4,845	11,020	18,265	40,126
Other druggists' sundries	.....	27,363	.....	118,228
Balloons *gross*	13,708	15,072	97,492	84,886
Toys and balls	.....	5,671	.....	15,357
Bathing caps *doz.*	7,873	16,691	26,851	49,341
Bands	21,036	7,218	74,082	26,380
Erasers	27,225	16,225	118,486	69,110
Hard rubber goods				
Electrical goods	175,927	16,956	562,143	53,696
Other goods	.....	15,711	.....	65,235
Tires				
Truck and bus casings, *number*	16,099	295,742	71,529	1,257,760
Other automobile casings, *number*	62,238	532,832	261,360	2,207,368
Tubes, auto *number*	52,719	71,669	227,564	304,028
Other casings and tubes, *number*	5,114	18,532	15,497	49,145
Solid tires for automobiles and motor trucks *number*	441	11,756	2,031	55,754
Other solid tires	62,457	9,154	473,790	64,729
Tire sundries and repair materials	.....	35,399	.....	135,738
Rubber and friction tape	47,969	12,683	179,106	48,549
Belting	149,117	87,354	755,433	383,614
Hose	431,145	127,577	1,489,593	437,028
Packing	166,988	51,634	562,680	178,425
Thread	98,744	58,457	400,251	245,322
Other rubber manufactures	.....	156,032	.....	629,681
Totals	.....	$1,892,713	.....	$7,615,863

Low and High New York Spot Prices

All Prices in Cents per Pound

	July		
PLANTATIONS	1935*	1934	1933
No. 1 thin latex crepe	11 1/8/12 3/4	15 7/16/16 5/8	7 3/8/10 1/2
No. 1 ribbed smoked sheet	11 3/4/12 7/16	13 11/16/14 3/8	6 1/2/ 9 3/4
PARAS			
Upriver fine	9 1/4/10	11 1/4/12	8 1/4/11

*Figured to July 27, 1935.

Rubber Goods Production Statistics

	1935	1934
TIRES AND TUBES*	Apr.	Apr.
Pneumatic casings		
Production *thousands*	4,376	4,627
Shipments, total *thousands*	4,989	4,305
Domestic *thousands*	4,908	4,212
Stocks, end of month *thousands*	10,673	11,621
Solid and cushion tires		
Production *thousands*	20	16
Shipments, total *thousands*	22	14
Domestic *thousands*	21	13
Stocks, end of month *thousands*	31	30
Inner tubes		
Production *thousands*	4,132	4,593
Shipments, total *thousands*	4,320	4,212
Domestic *thousands*	4,252	4,141
Stocks, end of month *thousands*	9,864	10.267
Raw material consumed		
Fabrics *thous. of lbs.*	8,011	19,371
MISCELLANEOUS PRODUCTS		
Rubber bands, shipments *thous. of lbs.*	285	342
Rubber-proofed fabrics, production, total *thous. of yds.*	4,062	3,877
Auto fabrics *thous. of yds.*	305	575
Raincoat fabrics *thous. of yds.*	1,398	1,670
Rubber flooring, shipments *thous. of sq. ft.*	456	437
Rubber and canvas footwear		
Production, total *thous. of prs.*	5,415	4,843
Tennis *thous. of prs.*	3,188	2,451
Waterproof *thous. of prs.*	2,226	2,392
Shipments, total *thous. of prs.*	4,210	2,749
Tennis *thous. of prs.*	3,276	1,868
Waterproof *thous. of prs.*	934	881
Shipments, domestic, total *thous. of prs.*	4,170	2,673
Tennis *thous. of prs.*	3,243	1,798
Waterproof *thous. of prs.*	927	875
Stocks, total, end of month *thous. of prs.*	17,056	17,774
Tennis *thous. of prs.*	6,241	7,378
Waterproof *thous. of prs.*	10,815	10,396
Rubber heels		
Production *thous. of prs.*	17,173	17,802
Shipments, total *thous. of prs.*	18,764	16,991
Export *thous. of prs.*	241	328
Repair trade *thous. of prs.*	7,405	4,673
Shoe manufactures *thous. of prs.*	11,118	11,991
Stocks, end of month *thous. of prs.*	34,869	39,961
Rubber soles		
Production *thous. of prs.*	3,525	5,018
Shipments, total *thous. of prs.*	3,543	4,739
Export *thous. of prs.*	7	5
Repair trade *thous. of prs.*	631	275
Shoe manufactures *thous. of prs.*	2,905	4,459
Stocks, end of month *thous. of prs.*	3,897	4,989
Mechanical rubber goods, shipments		
Total *thous. of dollars*	5,711	4,297
Belting *thous. of dollars*	1,394	863
Hose *thous. of dollars*	1,949	1,498
Other *thous. of dollars*	2,368	1,937

*Data for 1934 are estimated to represent approximately 97% of the industry.

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

London Stocks, May, 1935

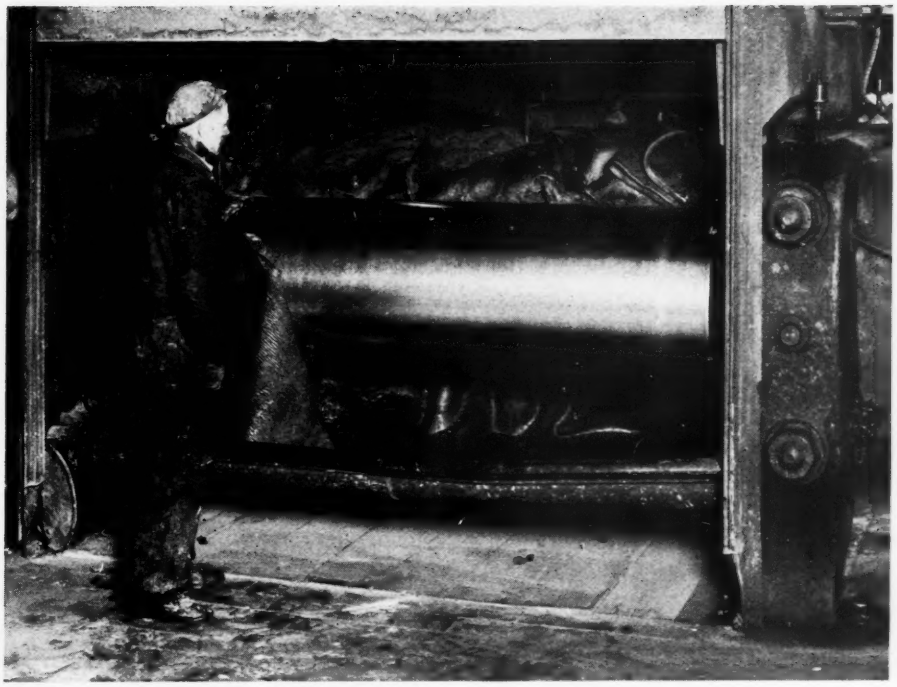
			Stocks, May 31		
LONDON	Landed Tons	Delivered Tons	1935 Tons	1934 Tons	1933 Tons
Plantation	8,117	6,737	95,684	42,173	41,944
Other grades	6	25	38	17	54
LIVERPOOL					
Plantation	*2,639	*1,296	*71,927	*54,007	*56,540
Total tons, London and Liverpool	10,762	8,058	167,649	96,197	98,538

*Official returns from the recognized public warehouses.

Imports by Customs Districts

	May, 1935 *Crude Rubber		May, 1934 *Crude Rubber	
	Pounds	Value	Pounds	Value
Massachusetts	6,604,220	$742,409	8,840,282	$879,449
New York	51,102,343	5,529,276	82,592,988	7,679,098
Philadelphia	817,888	100,353	3,662,255	309,697
Maryland	2,332,630	241,352	4,872,484	405,963
Mobile	1,097,046	128,020	.....	.....
Virginia	.....	.....	112,000	13,046
New Orleans	44,800	4,868	1,462,925	138,074
Los Angeles	5,498,009	661,137	9,647,427	883,524
San Francisco	1,082,890	124,309	434,560	47,007
Oregon	.....	.....	11,200	981
Ohio	200,442	20,145	142,678	13,042
Totals	68,780,268	$7,551,869	111,778,799	$10,369,881

*Crude rubber including latex dry rubber content.



LAUREX

is the ideal plasticizer of rubber at milling, calendering and tubing temperatures. This reduces factory costs because of lower power required and greater output per hour.

The extra plasticity is not carried into the finished goods because LAUREX is also the ideal activator of vulcanization and assists in producing a good, firm, tight cured rubber that resists wear and tear.

LAUREX should be used in practically all heat cured rubber goods. Try as little as four ounces in a stock heavily loaded with untreated clay or whiting and note the beneficial effect on the cure and quality of the rubber.

LAUREX is shipped in 50 pound bags. It is in a pulverized form, easily handled in the compound room and disperses easily and quickly in rubber.

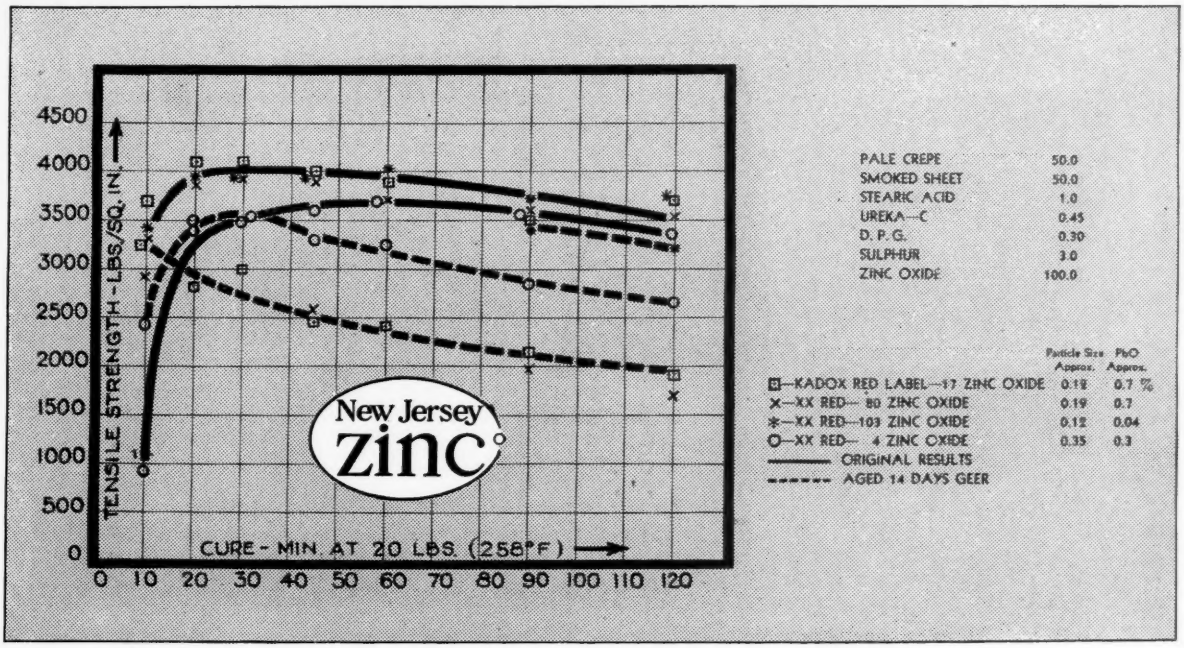
CHEMICAL DIVISION

Naugatuck Chemical

DIVISION OF UNITED STATES RUBBER PRODUCTS, INC.

1790 BROADWAY, NEW YORK, N. Y.

"Fast" and "Slow" Curing Zinc Oxides with "UREKA C" and "D.P.G."



No. 42 of a series of charts showing a comparison of "FAST" and "SLOW" curing Zinc Oxides with typical accelerators.

With "Ureka C" and "D.P.G" acceleration, Kadox Red Label-17, which contains lead in the form of PbO, gives original results which are somewhat higher than the lead-free brand (XX Red 103). The differences, however, are less marked than in the case of "Ureka C-Guantal" (Chart 32) and "Ureka C" (Chart 37). XX Red 4 in all cases shows retardation. The Geer oven aging results show greater deterioration for the leaded brands, as was the case with Ureka C, and Ureka C-Guantal. XX Red 103 in this compound shows especially good aging properties.

THE NEW JERSEY ZINC COMPANY
160 Front Street, New York

Place my name on the list to receive **The Activator.**

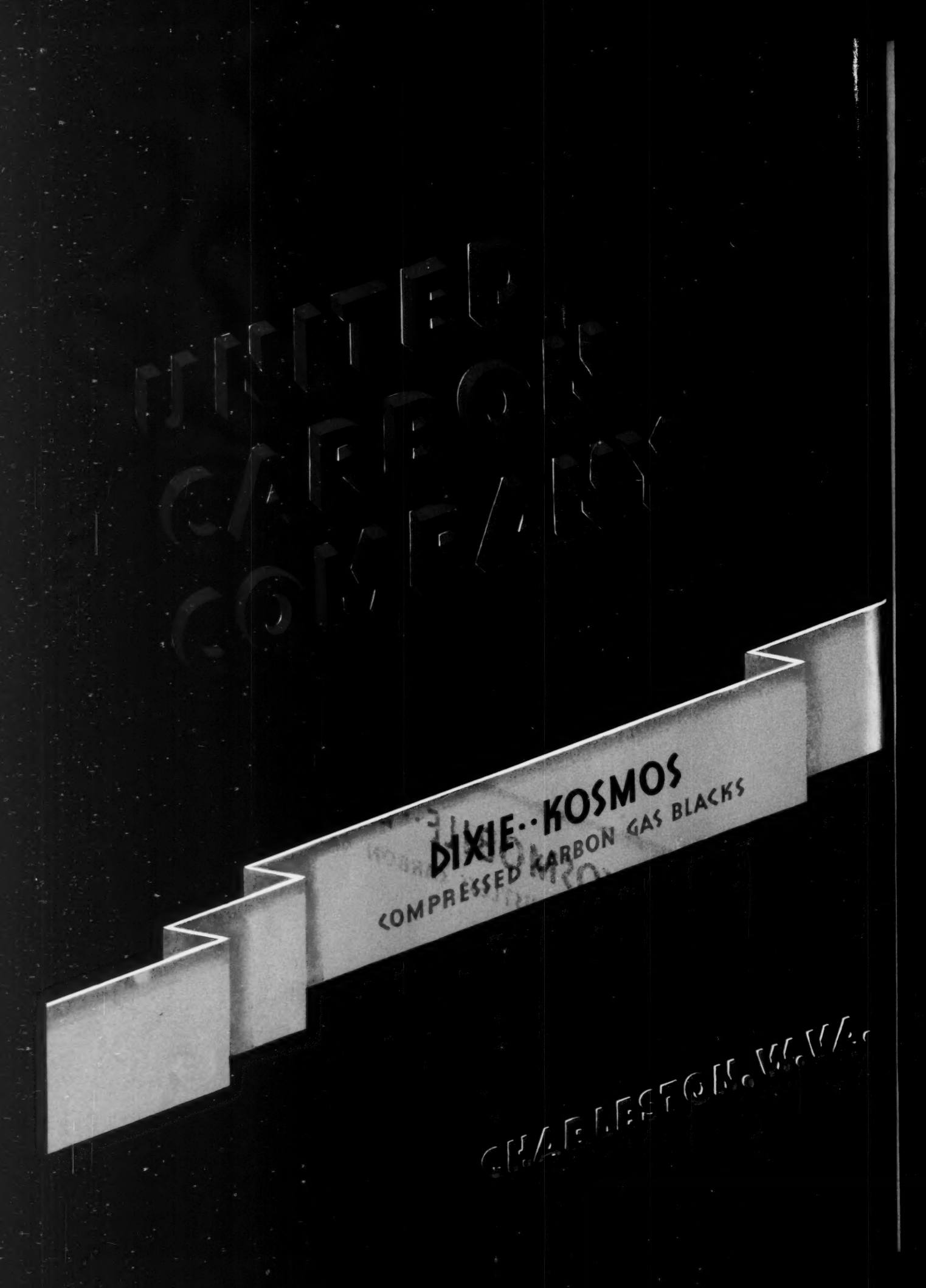
Name .....

Address .....

.....

UNIFORM QUALITY
ZINC OXIDES

THE NEW JERSEY ZINC COMPANY

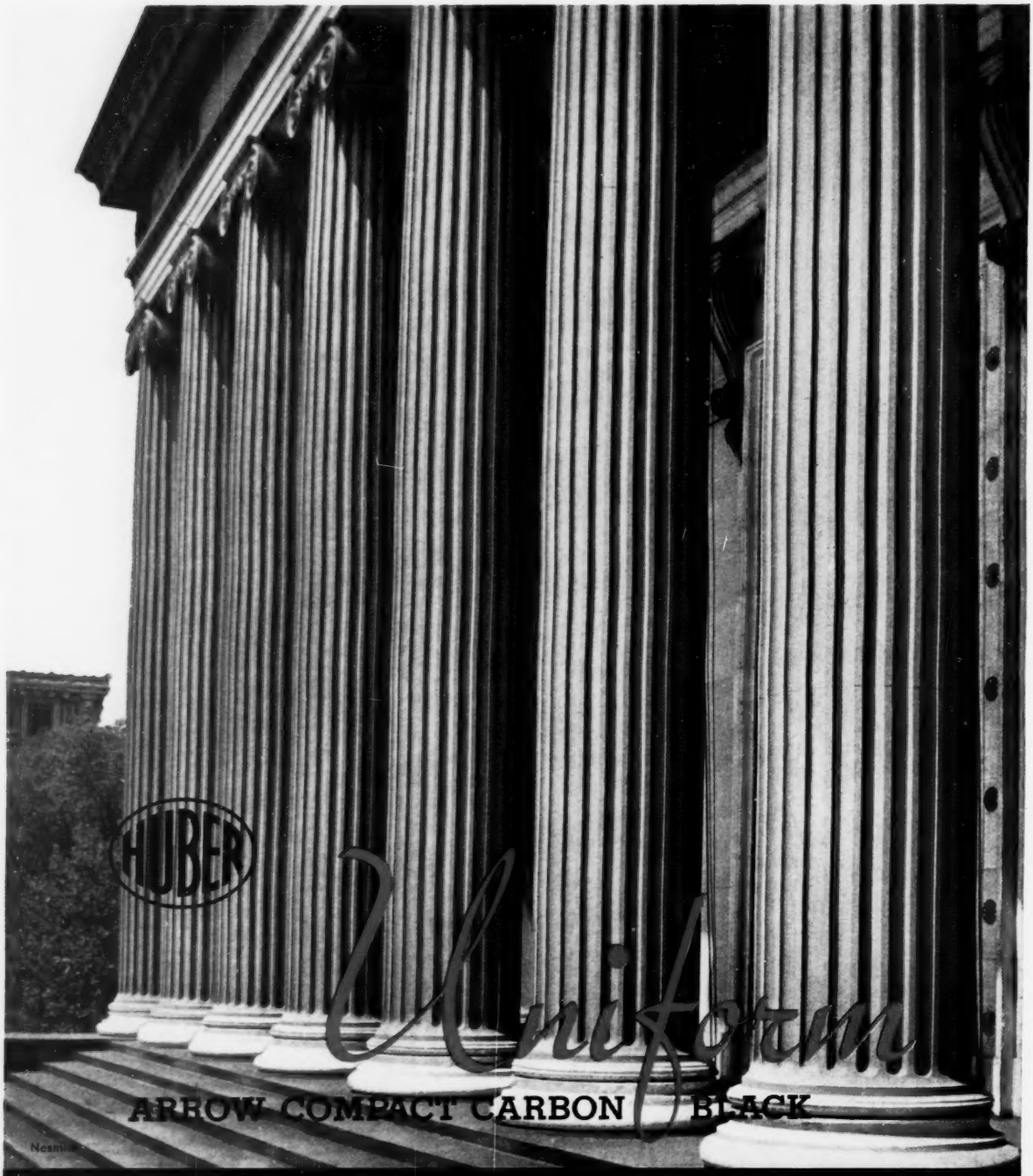

UNITED
CARBON
COMPANY
DIXIE · KOSMOS
COMPRESSED CARBON GAS BLACKS

• Bag after bag, drum after drum, every pound exactly the same as every other pound.

Modern equipment, experienced operators and a control laboratory checking every step in the manufacturing operations, have contributed to building for us an enviable reputation for the high quality of Aero Brand Rubber Chemicals. Manufactured at Warners, N. J.; Warehouse stocks at Detroit, Mich., and Joliet, Ill. Distributors stocks in Trenton, N. J., and Los Angeles, Cal., (H. M. Royal, Inc.). Boston, Mass., (Philipp Bros., Inc.). Chicago, Ill., (Herron & Meyer). Akron, Ohio, (Akron Chemical Co.).

American Cyanamid & Chemical Corporation

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.



The consistently uniform quality of Huber Compact Carbon Black is one of the important reasons for its wide acceptance by leading tire manufacturers the world over. The method of obtaining and maintaining this higher constant of uniformity is the exclusive Huber process of producing granulized dustless carbon black.

A practical trial is the best demonstration

J. M. **HUBER** INC.

NEW YORK CITY